

# THE IRON AGE September 21, 1933

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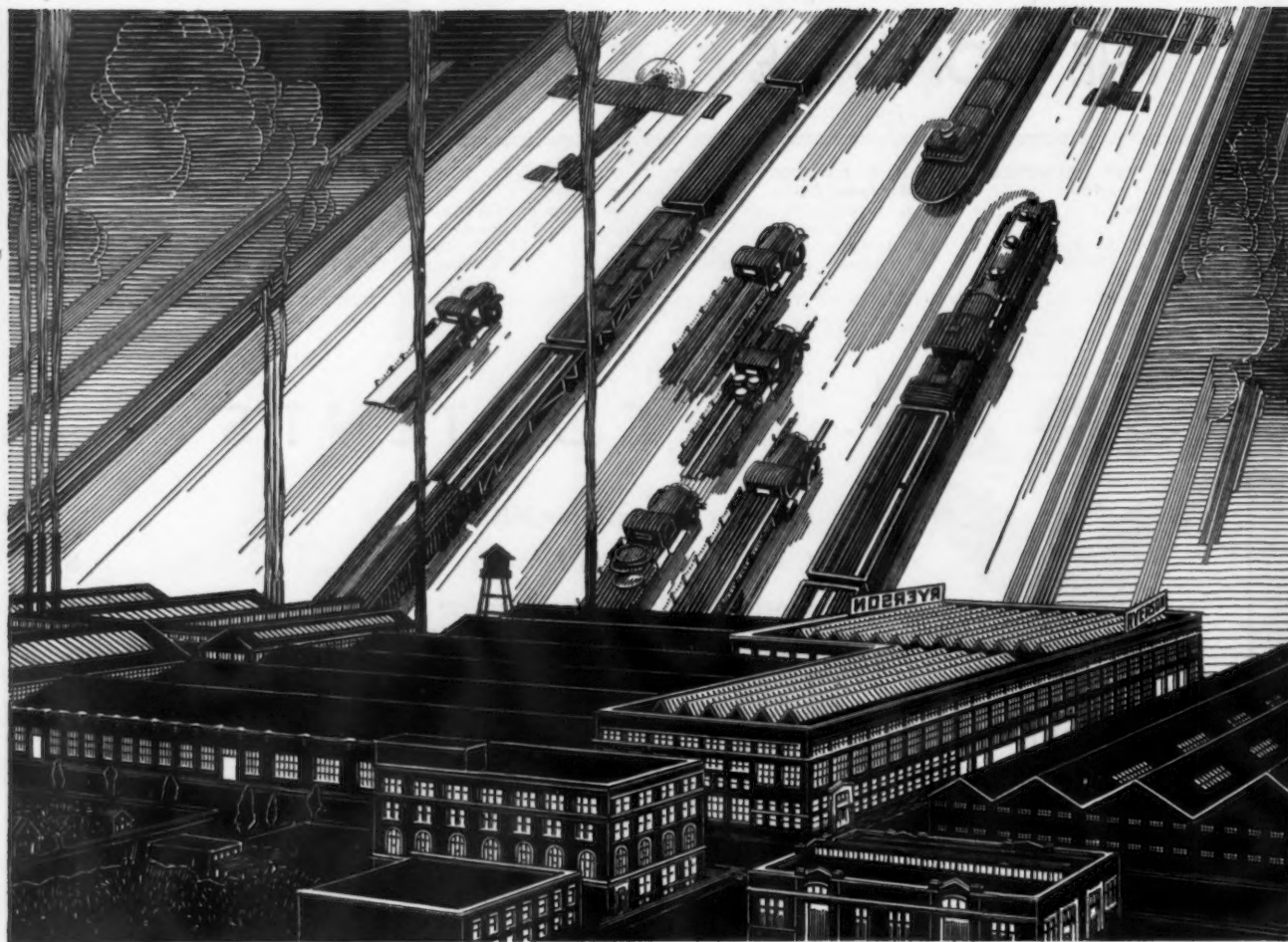
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# THE IRON AGE

ESTABLISHED 1855

SEPTEMBER 21, 1933

Vol. 132, No. 12

**Green Insists  
N.R.A. Curtail  
Work Weeks**

Threatening Open Fight,  
Head of A. F. of L. Pre-  
dicts 7 to 8 Millions  
Will Be Idle in Winter

**Richberg Fears  
Great Labor War**

**Two Brooklyn  
Court Orders  
Bar Picketing**

Striking Shoe Work  
Enjoined From Picketing  
Guards at 15 Factories

**Silk Mills Shut,  
30 Injured in  
Jersey Red Riot**

Police Battle Commu-  
nist Tear Gas, Riots in

**COAL MINERS  
STRIKE FOR NRA**

**SILK PLANTS CLOSE,  
FEARING VIOLENCE**

Scores of Dyeing Concerns in  
Area Suspend in

**EARLY SETTLEMENT  
SEEN IN HOTEL STRIKE**

**STRIKE ORDERLY  
AT GREENSBURG**

900 Workers  
Raided

**STRIKES HERE  
DRAW PROTESTS  
TO NRA HEAD**

ss. Pitt Tells John  
of Reported Code  
Violations.

**EST DEPLORED**  
at Once Asked  
of Misuse

**THEATRE BOMBED  
AT DOBBS FERRY**

Policeman Guarding Egypt  
Movie Deafened for Hour—  
Sleeping Village Shaken.

**NRA AIDE BLOWN FROM BED**  
Made in Car in Fourth  
After Labor Row—  
in Demands

**Akron Battle Is Brewing  
Over Rubber Layoffs**

**Foundry Strikers  
Go Back to Work**

Wage Agreement Is Reached  
at Coldwater Industry

**MOST** of this one week's crop of trouble  
is in unionized districts or trades. Open shop  
areas are peaceful with men on production;  
not on picket duty. Food for thought for NRA.

in Paterson Silk Strikers  
100 More Workers Join  
Walkout of 12,000  
Herald Tribune

**20,000 CALLED OUT IN  
DIXIE IN SILK STRIKE**

**CLEANERS PLAN  
STRIKE TODAY**

1,500 Employees Demand  
Higher Wages And

**STRIKERS STONE  
MINE OFFICIAL**

New Yorker Injured,  
Bombed Near  
Scranton

**8,000 Seamen  
On Great Lakes  
Plan to Strike**

Union Members at Buffalo  
Erie and Ashtabula Have  
Already Voted to Quit

**N.R.A. Flouted, They Say**

**STRIKING CHILDREN  
JEER TRUANT OFFICER**

300 Stayed From Bronx  
School  
Refuse to Open Classes  
to Come

**TEACHERS GO ON STRIKE**

**2,500 Strike in Al**  
Silk Workers Protest  
Code Jurisdiction

**Buffalo Feared as  
Strikers Remain Out**

**Guard Bog in  
Cranberry Strike**

**NRA HERE COMBATS  
STRIKES BY 34,000**

20,000 Button and Embroidery  
Workers Plan a Walkout

**N.R.A. Prevents  
Cleveland Car  
Out Today**

Heeds Request From  
atal. Postpones Strike  
by 3,000 Workers  
Set for Saturday

**MINERS PUSH PLAN  
TO START 'HOLIDAY'**

Strike Will Be General in  
Pennsylvania Soft Coal Re-  
Today, Says Leader.

**U. S. LABOR BOARD  
HUNTS MEDIATOR**

Ohio Agent  
and to M  
Peace  
in Penn

**BOMBING SEEN  
AS WAR TOCSIN  
IN MINE RANKS**

**JOHNSON FACTORY  
ACCUSED BY UNION**

brics, Inc., Charged  
Violating Code in  
Missing Employee

**STRIKE FOR NRA CODE  
BITUMINOUS MINES**

Stay Out of West Newton  
Pits—Pinchot Bans  
Mass Picketing.

# Choosing the Right Drive—3

## Multiple V-Rope and Pivoted Motor Short Center Drives

**T**HIS method, although comparatively new, is used extensively in similar fields to that of the direct chain method. In both production shop and process plant short center driving the V-rope method enjoys a wide application. There are, however, certain inherent characteristics that make it possible to differentiate between the two methods. Referring back to the description of the direct chain method, the V-rope is also applicable to the direct driving of production and process plant equipment, with certain specific restrictions, from motors operating at standard synchronous speeds of 720 to 1800 r.p.m. There are several makes of V-rope drives available, the chief difference being in the construction of the ropes. This type of drive consists of a driving and a driven sheave grooved for one or more cord, fabric and rubber constructed ropes of trapezoidal cross section. Power is transmitted by the wedging effect of the ropes in the V-shaped grooves. The ropes are designed to prevent bottoming, thus providing against air trapping when the ropes are operating at high speed. This drive will operate in either direction with the slack side on top or bottom, thus enabling it to be reversed readily. It will operate successfully

either horizontally, vertically or at an angle, but take-up facilities must be provided so that proper tension can be maintained. Fig. 13 shows 200 hp. being transmitted on a 50-in. center, illustrating one possibility of this method. The drive is noiseless and requires no lubrication, with the exception of an occasional slight application of commercial castor oil.

### Uses of V-Rope Drive

The V-rope can be employed for the direct integral driving of machine and wood working tools where slight slip is permissible and where the ropes can be protected from oil and grease. In comparing direct chain and V-rope driving for this class of service, these are really the determining factors.

From a first cost standpoint in the moderate power field they are comparable, but the chain drive if properly lubricated will last longer. For certain classes of machine tool operations such as internal and external grinding where smoothness of drive is essential the V-rope method should be employed, because of the absence of chatter, which to a degree is evident with chain.

In process plant direct motor to apparatus driving there are additional

factors controlling selection between the chain and V-rope method. These are positive input speeds, atmospheric conditions, ratios, temperatures and adjustment facilities. In this field of short center driving these factors must be considered, because the V-rope is not capable of positive velocity ratio, it will not function efficiently in certain atmospheric conditions, its ratio capacity is limited, high temperatures affect the ropes and adjustment facilities are imperative. Regardless, however, of these restrictions, the V-rope method is applicable to numerous drives in the process industry because the maintaining of positive velocity ratios is not essential in many applications, ratios not exceeding 8 to 1 are numerous, temperatures are normal and adjustment facilities can be provided. The deciding factor generally in driving of this class is the atmospheric condition, because in the majority of operations it is abnormal. Based on the construction of the V-ropes and lack of adequate protection, oil, grease, corrosive acid fumes, dust and grit lowers the efficiency and shortens the life of the ropes. Where there is an absence of these particular atmospheric conditions and based on a consideration of the other factors men-

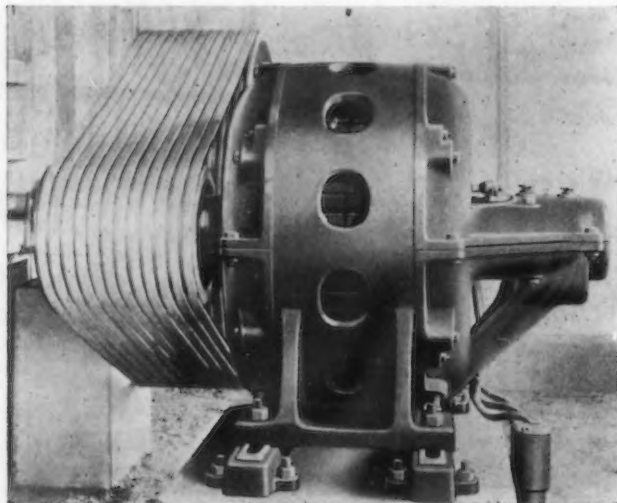
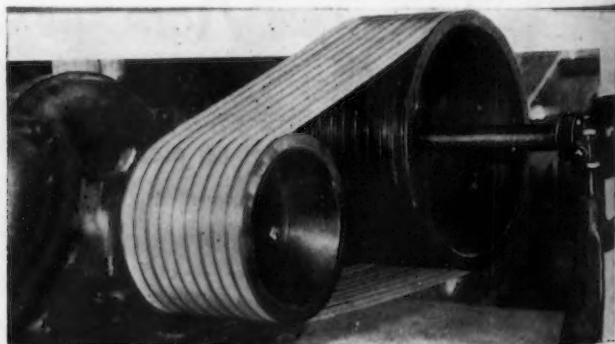


Fig. 13 (at left)—Two hundred horsepower being transmitted on a 50 in. center by multiple V-rope

Fig. 14 (below)—Where atmospheric conditions permit in process industries, V-rope drive is economical and efficient





By **WILLIAM STANIAR**  
Mechanical Transmission Engineer  
E. I. DuPont de Nemours & Co.



tioned the V-rope drive is economical and efficient. Due to its extreme flexibility and elastic qualities it can be successfully employed where pulsating and shock loads exist. It can be operated without difficulty in wet and sloppy conditions and is usually so designed that if one or two ropes of the set break, the drive will continue to function, based on the capability of the remaining ropes carrying the load for a short period. In process plant and production shop group driving, the V-rope drive is frequently employed as a connection between motor and head- or line-shaft. Such an installation is illustrated by Fig. 14.

There are frequent occasions in process driving where the integral mounting of motors with special apparatus is necessary based on space limitations. The V-rope drive is particularly adaptable to air compressor driving under these conditions because

of its resistance to pulsating loads and the possibility of utilizing the fly-wheel of the compressor as the driven sheave, thus eliminating the troublesome idler pulley. A drive of this character is shown by Fig. 15.

It is naturally better practice to have both the driving and driven sheaves grooved, but where it is desirable to substitute the V-rope drive for an idler controlled flat belt short center installation quickly and at small expense, it is not necessary to groove the driven wheel. The V-rope will operate successfully on a crowned or flat face driven wheel as illustrated by Fig. 15-A. The best results are, however, obtained when the driven wheel is flat face. There is very small power loss and the ropes ride evenly without appreciable side slip.

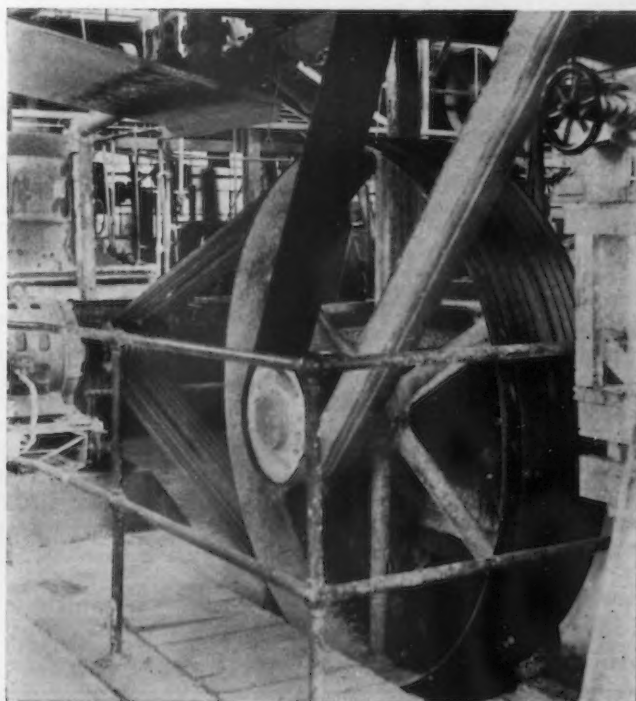
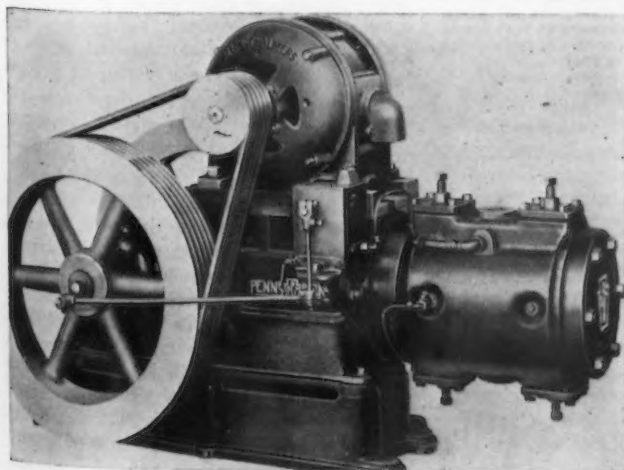
An attribute in favor of the V-rope drive over the silent and multiple strand roller chain is that center dis-

tance is not so restricted. Six to eight ft. is approximately the limit for high speed driving chain, while the endless V-ropes are made to accommodate centers of 12 to 14 ft., a demand frequent in process operations.

Since the advent of the V-rope drive rapid progress has been made in the development of the ropes and sheaves. Until very recently all makes were endless, thus confining their use to direct motor driving, based on required take-up facilities and limitation of center distance capacity. V-rope driving is, however, about to enter a new field because of the introduction of an efficient and practical fastener or coupler for the individual V-rope. This will make possible the use of this type of drive in most all classes of driving. Take-up facilities will not be necessary, because the ropes can be shortened and recoupled and center distance will not be a re-

Fig. 15a (at right)—V-ropes will operate successfully on flat or crowned pulleys without appreciable slip or loss

Fig. 15 (below)—V-rope drive method affords the machine designer unusual opportunities for compact construction



striction. Whether comparative first cost will be prohibitive cannot as yet be determined. This development is shown by Fig. 16.

V-rope can be obtained in duplex form so as to accommodate idlers and all manner of complex driving if such is desired.

Based on a similarity of application the characteristics of the "multiple V-rope" method of driving for production shops and process manufacturing plants will be combined.

#### The Pivoted Motor Method

While it is true that special tannage leathers possessing high friction values are capable of remarkable performance on moderate and high ratio short center driving from stationary motors, it is a fallacy to believe that similar service can be expected from regular oak tanned leathers, rubber or



Fig. 16—A practical fastener has been recently introduced for V-rope, removing the endless belt restriction

fabric belting. Therefore the tendency has been, based on the initial cost of the high friction leathers, to utilize methods foreign to belting for short center work regardless of ratio. This naturally has reduced the consumption of belting of all types. This tendency has to a great extent been overcome by the recent introduction of the "pivot motor" short center belt drive. The chief difficulty with the usual type of belting on short center work from a stationary motor is

"slip," caused by comparatively low fractional co-efficients and a lack of accumulated lineal elasticity, based on the shortness of the belt and the ratios involved. In an endeavor to equalize tension with load these difficulties necessitate an extremely tight belt, resulting in heavy bearing pressures and premature belting destruction. The pivoted motor drive makes possible the use of all types of leather, rubber and fabric belting on short center moderate and high ratio drives because it automatically synchronizes belt tension with load requirements. Naturally more load can be transmitted with this device size for size if special tannage leather belting is employed, but for the average short center work any belting type can be used, preferably if endless. The metallic fastener can be employed, but it causes motor vibration. The drive consists of a cast iron base on which are mounted two malleable iron fulcrumed arms. The motor is secured to these arms and so adjusted that it acts as a counterweight on the belt. The pulleys employed are standard and the belt is as mentioned above. The slightest fluctuation of load causes a change in position of the motor. Based on its principle of operation and the design of the equipment, the drive can be either horizontal, vertical or at an angle to the driven machine or shaft. For maximum performance and efficiency of this drive the tight side of the belt should be next to the pivot. One of the great advantages of this method is that belt tension can be calculated as soon as weight of motor and layout of drive are known. Compared with other short center methods its cost is favorable. Slide rails for the motor are unnecessary because adjustment is automatic. With endless special tannage leather belting, this method has shown under test efficiencies of 98 to 99 per cent. This drive can be mounted on floor, ceiling or wall and requires no lubrication with the exception of occasional dressing of the belt.

#### Uses

The pivoted motor drive is applicable to both production shop and process plant short center driving. However based on its particular attributes, its field is larger in the latter. For the integral motor driving of machine and wood working tools it is doubtful whether it possesses any advantage over the methods previously discussed. For the direct belt driving of group head- or line-shaft it can be frequent-

### Production Shop and Process Manufacturing Plant Driving

METHOD	Multiple V-rope		
SERVICE	Driving machine and wood working tools, where motor is either mounted separately or integrally with machine. Driving machine and wood working tools where input speed is not practicable for direct coupled motor connection. Driving machine and wood working tools where positive velocity ratio is not absolutely necessary. Driving moderately loaded head- and line-shafts. Driving various types of equipment in process plants such as blowers, exhausters, pumps, compressors, mixers, mills, etc. Driving such equipment when not subjected to grit, dust, excessive mineral oil and corrosive acid fumes.		
CENTER DISTANCES	As close as sheaves and machinery will permit. With endless type—maximum 12 ft. 0 in. Coupled type—as desired.		
LUBRICATION	No lubrication is required with the exception of periodic application of commercial castor oil for the prevention of side glazing.		
SHEAVES	Driver for moderate and heavy loads—cast iron. Driver for light loads—pressed steel or cast iron. Driven for moderate and heavy loads—cast iron. Driven for light loads—pressed steel or cast iron.		
HORSEPOWER CAPACITY	Fractional to 2000.		
PERMISSIBLE RPM. OF MOTOR SHEAVE	Light Section Ropes	Medium Section Ropes	Heavy Section Ropes
	18 to 3600.	900 to 1800.	520 to 900.
SPEEDS IN FPM.	Up to 6000.		
SPEED RATIOS	1:1 to 8:1.		

### Production Shop and Process Manufacturing Plant Driving

METHOD	Pivoted motor short center belt drive	
SERVICE	Driving group line- or head-shafts if necessary to place motor in inaccessible location. Driving group line- or head-shafts if necessary to place motor on wall and drive vertically. Driving individual apparatus when in inaccessible locations and where structural conditions cause angular or vertical placement of motor. Driving individual apparatus where sustained efficiency is in demand at peak loads. In any atmospheric condition if proper type belting is employed. When driving vertically, motor can be placed either above or below the driven shaft.	
CENTER DISTANCE	As close as pulleys and driving conditions will permit. Maximum—10 ft. 0 in.	
RATIOS	1:1 to 8:1	
HORSEPOWER CAPACITY	Fractional to 400.	
PULLEYS	Driver	Driven
	Standard type for motor.	Cast iron, steel or wood depending on atmospheric conditions.
BELTING	Mineral retanned leather, endless, for highest efficiency; regular oak tanned leather, endless, for moderate service; rubber and fabric if endless for moderate service; atmospheric conditions should control type. See group shafting and belting tabulation.	
LUBRICATION	Occasional oiling of fulcrum arms and periodic dressing of belting.	
PERMISSIBLE RPM. OF DRIVER	All standard motor speeds.	



ly employed in both classes of plants to a better advantage than either chain or V-rope, because of the possibility of placing the motor at any desired position to the driven shaft.

Based on space limitations and structural conditions it may be necessary to hang the motor on a wall and drive vertically to the head- or line-shaft. This can be accomplished by this type of drive as illustrated by Fig. 17, based on the characteristic of automatic tensioning. The motor can also be hung to cross stringers as illustrated by Fig. 18. Both loca-

driving. In process plant short center work it is suitable for direct belt driving blowers, exhausters, compressors, pumps, grinders, mills, etc., where high efficiency is required and where shut down, because of take-up requirements, is hazardous. Atmospheric conditions usually found in process operations are not injurious to this drive, if the proper type of belt is employed for the condition involved. Comparative tests have shown that this drive when equipped with mineral retanned leather is capable of maintaining its rated efficiency at peak

Means are provided, however, with this equipment for taking care of excessive belt stretch, in that the motor can be moved in relation to the driven shaft by screw adjustment of the pivot shaft. When motors are installed in locations difficult of access such as ceiling drives, excessive belt stretch, if neglected, may defeat the efficiency of the pivoted motor mounting. For this reason the type of pivoted motor base as shown by Fig. 20-A should be employed. This not only provides greater belt take-up facilities, but also insures protection



Fig. 17 (above)—Automatic tensioning through pivoted motor on a vertical flat belt drive



Fig. 18 (above)—A horizontal pivoted motor flat belt drive

Fig. 19 (at right)—A floor installation of pivoted motor drive as installed in a process plant



tions would be troublesome by other short center methods, because of inaccessibility and therefore the difficulty of manual adjustment. In process plant direct motor to apparatus driving there are numerous cases where inaccessibility causes power loss and high maintenance due to neglect of proper adjustment between driver and driven. Automatic adjustment or belt tensioning is one of the valuable features of the pivoted motor drive. When it is once set in correct relation to the driven medium, the proper load tension of the belt is constantly maintained. This feature is most valuable when short center direct driving is required in remote or inaccessible locations. Theoretically flat belting is highly efficient when properly installed and when maintained at a tension proportionate to the load requirements. The pivoted motor drive provides these features, therefore permitting belting to be considered for the most difficult problems of short center

loads based on its rated capacity, a fact not possible without synchronization of belt tension with load. Typical applications in process plants are shown by Fig. 19 where the motor is located on the floor and by Fig. 20 where the motor is hung on a wall.

In all flat belting installations whether of short or long center, belt stretch is always evident. It is naturally less with short center applications because of the decrease in actual belt footage employed. To a great extent this element of stretch is automatically adjusted by the action of the pivoted motor mechanism.

against the motor dropping, if for any reason the belt is removed. This protection is accomplished by the supporting chain shown in the illustration.

To overcome the inherent difficulties of the vertical drive whether the motor is placed above or below the application, a special design of the pivoted motor base is available. When the pivoted motor drive is installed with the motor directly below the driven shaft means must be furnished to take a portion of the dead weight of the motor off the belt and when the motor is directly above the driven

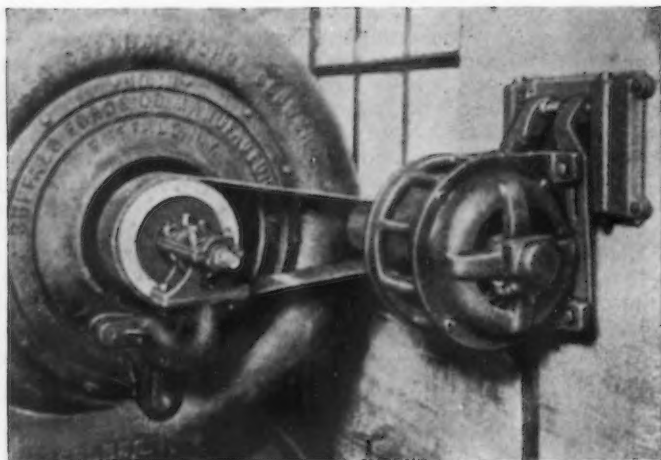


Fig. 20—Short center, pivoted motor, flat belt drive from wall mounting to blower

shaft means must be provided to take the entire weight of the motor and in addition furnish the necessary initial belt tension. This is accomplished by spring tension integral with the base as shown for the motor above the application by Fig. 20-E. A similar design is employed when the motor is below.

Based on a similarity of application for the direct driving of group line- and head-shafts and the direct belt connection of various apparatus in production and process plants the characteristics of this method will be combined.

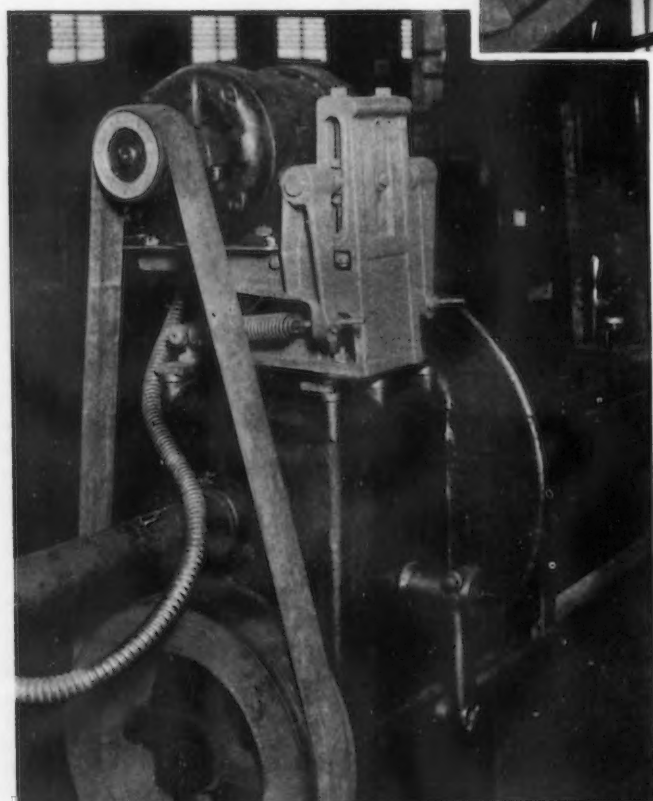
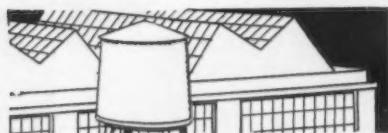
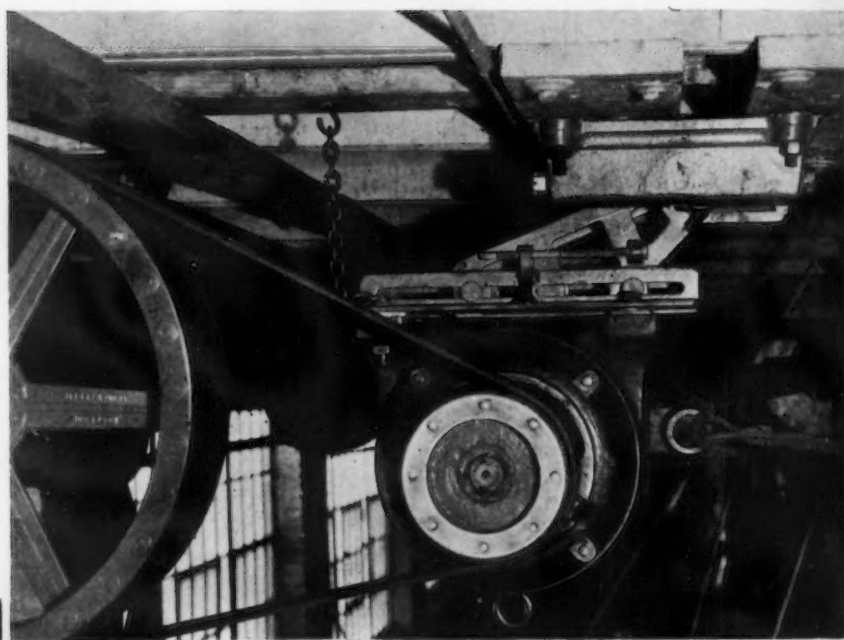


Fig. 20a (above)—For inaccessible locations, this type of pivoted mounting offers increased adjustment range and prevents motor from falling if belt breaks

Fig. 20b (at left)—When the motor is directly above the driven shaft, a spring is used to compensate its weight and to provide initial belt tension

## Invisible Oxide Film Inhibits Corrosion

**S**USPENDED solid particles play an important part in the atmospheric corrosion of iron, but if the influence of the suspended particles is eliminated an invisible protective oxide film is formed on iron which affords some measure of protection. The foregoing statement may be made as epitomizing a notable contribution to the theories of corrosion contributed by W. H. J. Vernon, department of scientific and industrial research, Teddington, Middlesex, England, to the international corrosion conference



held under the auspices of the Electrochemical Society at Chicago, Sept. 7. The following has been taken from the Vernon paper:

Invisible oxide films on copper and lead have quite remarkable protective properties; such films could be produced simply by exposure of the metal, after cleaning, to the atmosphere of a room free from locally generated products of combustion. When, however, specimens of Armco iron and dead-mild steel were exposed in a similar way, instead of a protective film, isolated rust spots developed and increased in number until the whole surface appeared to be covered, notwithstanding that the relative humidity of the air was consistently well below the dew point. (Even at an advanced stage, bright interstices could be seen under a lens, showing the essentially discontinuous character of the product.)

The experiment was then tried of suspending the iron specimens inside a muslin "cage" (width of mesh, approximately 0.5 mm.) The result

(Concluded on Page 51)



# Controlling Combustion in the Open-Hearth Furnace

**T**HERE is a decided trend at the present time toward the installation of combustion control equipment on open-hearth furnaces. At the same time, the rapid development of the natural gas industry has made that fuel available to an ever increasing number of industrial purposes for steel plants. Natural gas is the logical fuel for the open-hearth, and when that furnace is to be equipped with combustion control, natural gas is preeminently suited for the job. This is true because natural gas, efficiently applied, enables the furnace operator to secure greater advantages and effect greater economies than can be secured with any other fuel.

On a natural gas-fired open-hearth furnace, combustion control equipment will effect economies in fuel consumption by the elimination of losses due to incomplete combustion or excess air. It will also result in a faster working furnace which will further reduce fuel consumption and increase the capacity of the plant. This decrease in fuel consumption may be as high as 25 per cent, while the faster working furnace should result in a 10 per cent increase in production. Furthermore, the life of the furnace may be increased as much as 20 per cent by the installation of combustion control equipment which will prevent the flame burning out the ports, roof checkers, etc. One may also expect more uniform furnace operation, practice can be more nearly standardized, a better quality of steel can be produced, and yield may be increased as much as 2 per cent. These are the principal economies that can be expected from the installation of combustion control.

Now let us take up the equipment necessary to effect these economies.

## Fuel and Air Control

The most important feature of combustion control equipment consists of the opportunity it affords for correctly proportioning the fuel and air. The infiltration of cold air on the average open-hearth furnace is surprisingly large; it may easily equal the total amount of air that goes in through the reversing valve. As indicated previously, this infiltration of cold air may be reduced by enclosing the furnace walls in steel plates or insulating

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Pittsburgh

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cement, but the problem of measuring the air input still presents itself. The installation of a pusher fan for blowing air into the furnace offers a ready solution for the air measuring problem, as well as many other advantages which may be summarized as follows:

1. It enables us to measure the air input.
2. It insures us that all the air going into the furnace is being preheated.
3. It practically eliminates the infiltration of cold air by maintaining a slight pressure throughout the system to the downtake on the outgoing side.
4. It reduces the heat losses up the stack by reducing the volume of the products of combustion.
5. It gives a higher flame temperature.
6. It increases the heat transfer in the regenerator.

When a fan is installed on a furnace, the air can be measured by an orifice meter in the air line. (See Fig. 1.) The air supply is varied by means of a blast gate or butterfly valve on this line. If natural gas is the fuel used an orifice meter in the gas line takes care of the measurement of the flow of gas very easily. These meters may be connected to two

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**M**ORE or less automatic operation of the open-hearth furnace is relatively simply achieved when natural gas is the fuel. Such is the contention of the accompanying article, which is the fourth in a series on the natural gas-fired furnace. The three articles that have already appeared are: Aug. 31, the general economics of the natural gas application; Sept. 7, the design of ports; Sept. 14, the design of regenerators. The next and last instalment will cover the heat insulation of the furnace.

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indicating flow meters mounted on a panel board, Fig. 2, on the charging platform. The furnace operator can then see the rate of flow of gas and air at a glance, and maintain the desired ratio by manual operation of the gas and air valves.

Of course, equipment for automatically proportioning gas and air is available. In such equipment the pressure drop across the gas orifice is balanced against the pressure drop across the air orifice and automatically regulates the flow of air by means of a motor driven butterfly valve. However, in the author's opinion, the system using indicating flow meters and manual operation of the valves is best because the furnace operator may desire to change the gas-air ratio several times during the working of a heat.

The gas and air could be proportioned correctly without installing flow meters, by reading the pressure gages and differential pressure gages of the orifice meters. These instruments may be mounted on the furnace platform and a table prepared showing the pressure readings that correspond to the proper gas flow and air-gas ratio. Although this is not as convenient as a flow meter reading directly in cubic feet per hour, it nevertheless can be used to considerable advantage.

When natural gas is the fuel used, the maintenance of the proper air-gas ratio is a simple problem; however, this is not true for other fuels. There is no satisfactory direct method of measuring the flow of producer gas because the tar, soot, and dust that accompany the gas build up around the orifice and make the pressure readings useless. There is also considerable difficulty measuring the rate of flow where tar or fuel oil is used as the fuel, because the pressure drop across an orifice for these fuels varies with the temperature and viscosity as well as with the rate of flow. If a combination of fuels is used on the open-hearth such as blast furnace gas and tar or coke oven gas and tar or oil, the proportioning of fuel and air becomes even more difficult because it is then necessary to adjust the air quantity for each fuel separately. Thus natural gas is the only open-

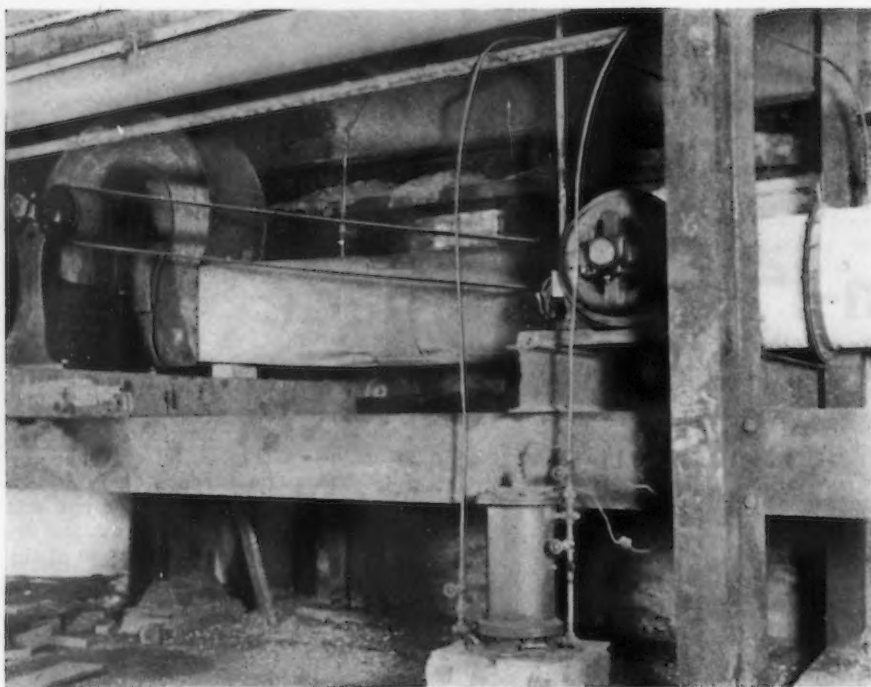


Fig. 1—The volume of air delivered by the blower is measured by the orifice meter in the air line (at right of picture).

hearth fuel that lends itself readily to combustion control.

Many open-hearth operators take the attitude that they do not need a fan on their furnace because they have sufficient stack draft to draw all the air required into the furnace. This reasoning is illogical because they overlook the fact that the principal reason for installing a fan is not simply to furnish the air but to enable them to measure the air.

When a pusher fan is installed on an open-hearth furnace it is usually necessary to make some changes in the reversing valve. The old style butterfly valve can be used with a blower but these valves are usually warped so much by the heat and leak so badly that a good part of the air for combustion is drawn through the cracks in the valve to the stack. For this reason these valves are not to be recommended. Several furnace equipment companies manufacture a balanced, sliding damper type water-cooled reversing valve. These valves are designed to be used with a blower. They remain tight permanently due to the water-cooling feature that prevents warping, and they are usually electrically controlled.

Another type of valve that has been constructed by a few open-hearth plants is the mushroom type reversing valve shown in Fig. 3. This valve consists of two mushroom air valves and two sliding dampers in the flues. These mushrooms and dampers are interconnected and electrically operated.

#### Draft Control

In addition to controlling the supply of fuel and air, the control of stack

draft is essential to complete combustion control. On a furnace equipped with a fan for supplying air, the fan and stack action of the regenerator should maintain a slight pressure throughout the furnace up to the ports on the outgoing side. At this point the stack draft should take hold of the products of combustion and carry them out of the system. If the draft is too great it will dilute the products of combustion with a large amount of cold air, thus increasing the stack losses and lowering the efficiency of the regenerators. If the draft is insufficient it will tend to smother the furnace.

However, when furnaces are con-

verted to natural gas and equipped with combustion control, the trouble is usually too much draft, rather than too little draft. The reason for this is that the use of natural gas as a fuel, the measurement of air for combustion, and the elimination of the infiltration of cold air, will greatly reduce the amount of stack draft required for the operation of the furnace.

In converting a furnace to natural gas, it is a good idea to check up on the condition of the stack damper, for it may be burned out or warped so badly that the stack draft cannot be cut as low as desired.

In order that the draft conditions in all parts of the furnace may be controlled at all times, indicating draft gages should be connected to the up and down-takes, the sewers, and the stack. The sewers refers to the flues between the regenerator and the reversing valve.

#### Temperature Control

Another important feature of combustion control on the open-hearth furnace is the control of temperature. The problem here is to time the furnace reversals so that the temperature on both sides of the furnace will be balanced. If the period between reversals is too long the temperature of preheat of the air becomes too low and the temperature of the waste gases at the stack becomes abnormally high, thus reducing the operating efficiency of the furnace.

The high temperatures at which the open-hearth is operated make it impossible to install thermocouples in the operating zone of the furnace. The usual practice is to install the thermocouples in the sewers. The temperatures at these points vary during the course of the heat, but just prior to reversing the furnace the temperature in the ingoing flue is about 500 deg.

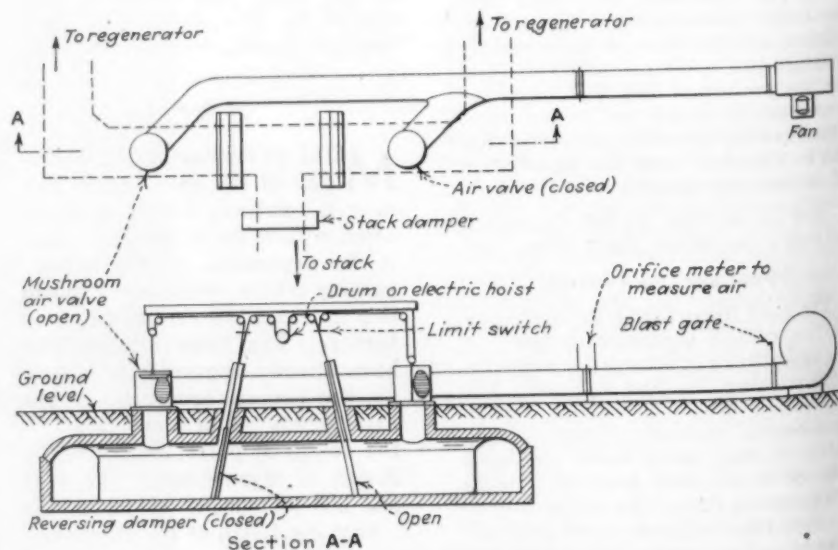


Fig. 3—Mushroom type of open-hearth reversing valve.



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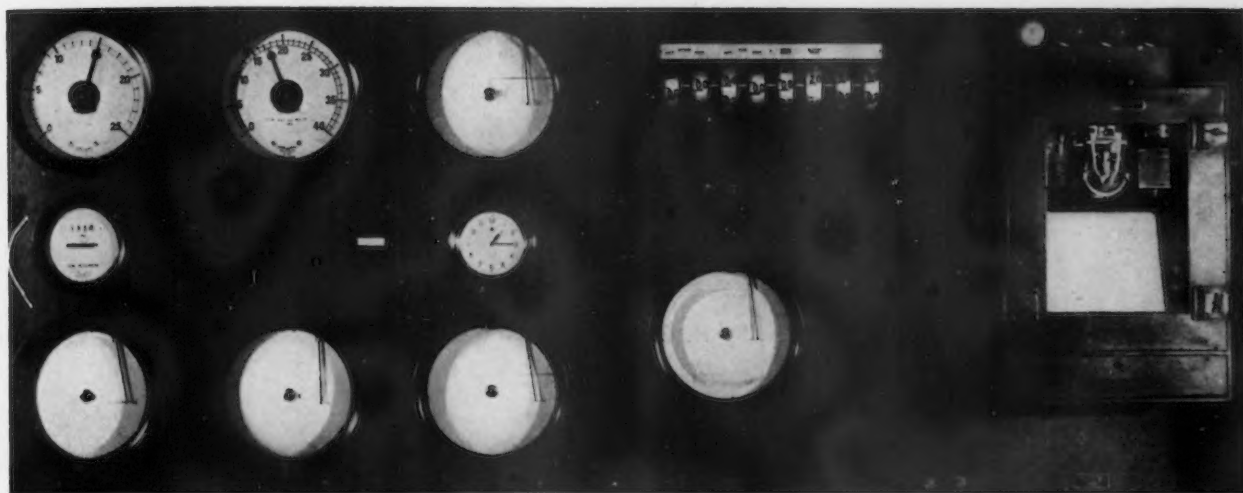


Fig. 2—Open-hearth combustion control panel on charging platform. Panel 1—Gas meter: Panel carries an indicator, recorder and integrator for measuring the flow of gas. Panel 2—Air meter: Panel carries an indicator and recorder for measuring the rate of air flow. Panel 3—Draft gages: Panel contains two recording draft gages recording the draft or pressure in the up and down-takes. One gage is connected to the right side of the furnace and the other to the left. A clock is also mounted on this panel. Panel 4—Upper instrument is a multiple indicating draft gage. It shows the draft in the up and down-takes, flue, and stack as well as the pressure in the air line from the blower to the reversing valve. The lower instrument is the dial of a  $\text{CO}_2$  recorder. Panel 5—Panel consists of a recording pyrometer operating a series of signal lights by means of which the furnace may be reversed on a temperature cycle instead of the usual time cycle.

F. while the temperature in the outgoing flue is about 1350 deg. F.

There are several types of temperature control equipment. One called the signal-light controller lights a red light when the temperature in the outgoing flue reaches the maximum temperature desired. A signal light controller of this type is shown on the last panel of Fig. 2. The furnace operator then reverses the furnace manually. Other control equipment au-

tomatically reverses the furnace when the temperature difference between the incoming and outgoing flues reaches a predetermined maximum value.

Reversing the furnace on a temperature cycle instead of the usual time cycle, increases the average air preheat, increases the life of refractories, and reduces fuel consumption.

The installation of complete combustion control equipment has reduced

costs sufficiently on jobs with which the author is familiar to justify the expense of installing this equipment. However, it must be borne in mind that natural gas is the only open-hearth fuel readily adaptable to accurate combustion control. Consequently, the economies that result from the operation of combustion control equipment, and the satisfaction received from this equipment, will be proportionately greater when natural gas is used as the open-hearth fuel.

## The Older Employee in Industry

THE problem of what to do about the employee who has grown old in a manufacturing organization and whose ability to do his usual work has lessened with the passing years is one which many an industry is finding serious. Just what business executives are doing to solve this problem is told in a new report by the Policyholders Service Bureau of the Metropolitan Life Insurance Company, entitled *The Older Employee in Industry*, which presents the findings of a broad survey of the subject.

Five thousand manufacturing companies were asked whether they have definite plans for dealing with the problem of the older employee. Of those replying, 800, which employ more than a million workers, stated that they have such programs in operation. These organizations told in some detail what they are doing. Details of these plans were tabulated,

analyzed, and prepared for presentation. According to this report, discovery of problem cases is the first detail to be considered. Usually, mere observation by foremen or supervisors is sufficient. Some companies, however, have plans for a systematic review of the records of employees when they attain a specified age. These plans are detailed in the report.



The next step, according to the report, requires decision as to what procedure is to be followed. Some companies, it was found, make it a practice to continue these employees at the same job, generally with adjustment in hours, wages, or duties. Sometimes special mechanical aid on the job is provided. Other companies make it a practice to transfer the older worker to another job. The factors which affect the selection of these new posts are discussed in this report; typical transfers are cited and described. Some organizations, the report states, provide special medical and safety supervision for older employees. These are set forth in some detail.

A limited number of copies of *The Older Employee in Industry* are available. As long as this stock permits, readers desiring copies will be supplied by the Policyholders Service Bureau, Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y.

# Locomotive Repairing Is a Big Business

By H. R. SIMONDS

**T**HE magnitude of the locomotive repairing industry in this country is not generally appreciated. This is partly because it is divided up among hundreds of repair shops. A recent report from the Eastern Railroads Committee gave the number of locomotives in service as approximately 50,000 with 11,000 waiting for repairs. A conservative replacement figure for a locomotive is \$80,000 which means that there is an investment of nearly \$4,000,000,000 in the locomotives in current operation and a further investment of \$800,000,000 in locomotives waiting to be repaired.

The extent of repairs on each individual locomotive varies greatly and in some plants frequently amounts to complete rebuilding on Class A repair work. One authority has estimated

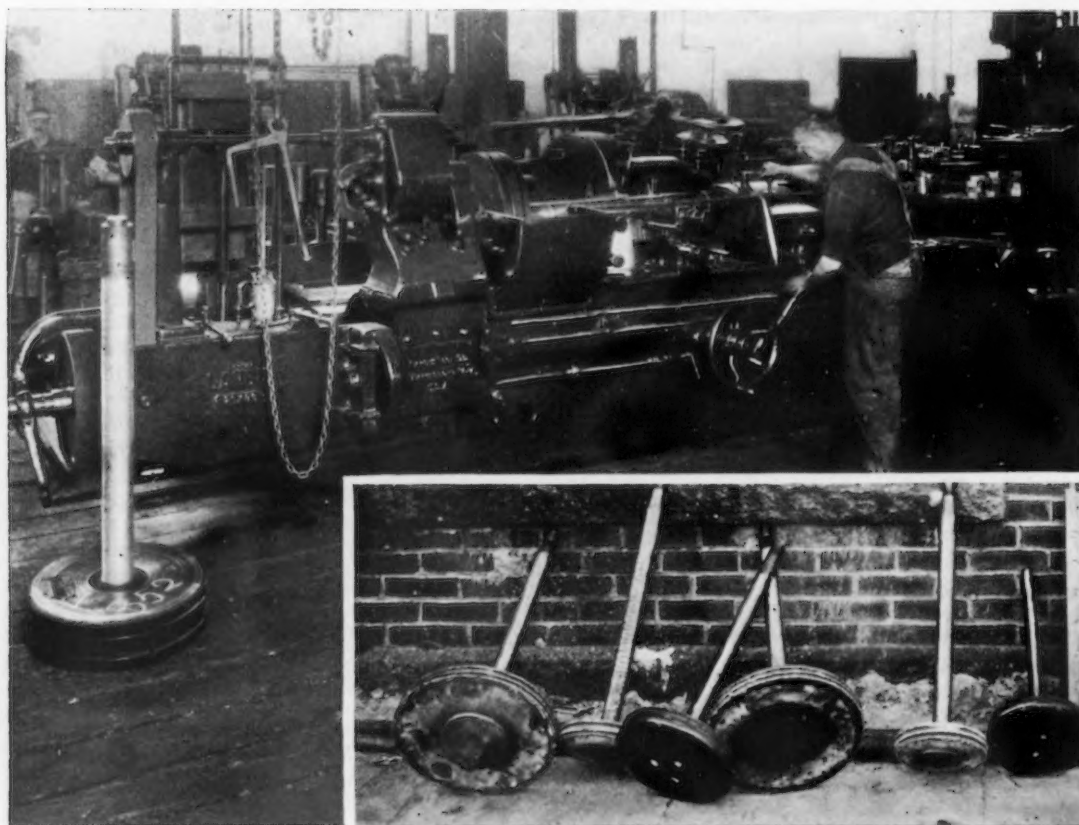
that 30 per cent of the locomotives in service enter locomotive repair shops each year for repair work which will average \$1000 a locomotive. On the basis of these figures the total locomotive repairing industry in the country would amount to some \$15,000,000 and this is probably a low estimate.

## Work on Production Basis

Many of the large modern locomotive repair shops are operated along production lines which rival for efficiency and system the practice in shops producing new machinery. This is an achievement which will be understood by anyone who visited a typical repair shop of fifteen or twenty years ago. A view in such a shop is shown in Fig. 1. In contrast

to this the modern shop is a model of neatness. A procedure followed at one of the leading repair plants is to completely disassemble each incoming locomotive, putting all of the material into stock and then rebuilding a locomotive from stock parts. The stripping for stock is a big operation in itself. All the parts as removed are thoroughly washed in modern metal parts washing machines. After this they are carefully inspected and repaired or rebuilt for stock. Thus badly worn parts are frequently machined or ground down to a smaller size for use on a smaller locomotive. Other parts are built up by laying on metal with a welding torch and then grinding down to the original dimension.

One of the parts frequently showing



**FIG. 3** — A rebuilt piston in a locomotive repair shop showing the machine tools which did the job. Locomotive pistons removed (lower right) from locomotives and ready to enter the repair sequence.







Fig. 1—A locomotive repair shop of twenty years ago. This condition is largely eliminated in the operation of modern shops.

excessive wear is the guide bar and this has been successfully repaired by laying on brass with an oxy-acetylene torch and then grinding to size on a large universal grinding machine. Fig. 2 shows a similar operation in grinding down a soft steel forging for a new guide bar. In this particular case the amount of stock removed is approximately 3/16 in. and production is at the rate of 14 min. per piece. A segmented abrasive wheel 44 in. in diameter is used.

#### Many Tools Required

Because of the great variety in the nature of the parts entering into the construction of a locomotive, almost

every type of standard machine tool is used in the modern repair shop. High production equipment or automatic tools of course are less frequently used than where greater repetition of work is possible, but modern conveyor systems and much repetition work are founded in a locomotive repair shop nevertheless.

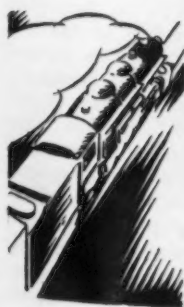
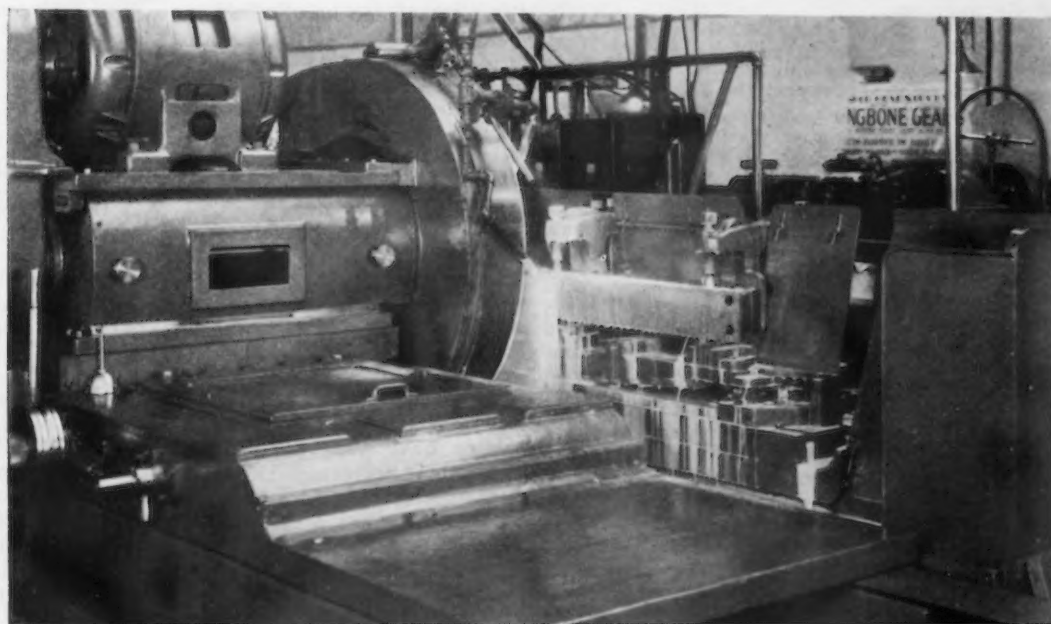
Take one item, tie-bolts, for example. One shop manager has evolved a system of repair of these bolts which closely approximates the original operation of manufacture. The bolts as removed from a locomotive are automatically washed and sorted as to size and the different sizes are then used just as if they were

raw material for the manufacture of new bolts.

Mill motors and control equipment for the new cold-rolled strip mill of the Inland Steel Co., Indiana Harbor, Ind., have been ordered from the Westinghouse Electric & Mfg. Co., East Pittsburgh.

Inland Steel Co., Chicago, has issued booklet of extras on bars, plates, shapes and semi-finished steel, incorporating all recent changes. It also includes tolerances and size data on the products of the company's bar, plate and structural mills.

FIG. 2—Grinding locomotive guide bars in a modern shop.



# New Things in Materials and Processes

## Alloys and the Globe-Circling Airplane

**A**LLOYS have been vitally important factors in the progress of aviation. The alloy steels and the non-ferrous alloys of aluminum and magnesium stand out particularly.

In his account of his world-circling and epoch-making flight, Wiley Post has frequently mentioned his debt to the adjustable pitch propeller. This has made easier his take-offs, his attainment of high altitudes and his increase in speed.

A contributing factor in the perfection of the propeller has been the use of a beryllium-copper alloy casting of 2.50 per cent beryllium, in the form of a bearing sleeve. Sleeves of this material have been made in quantity. They are claimed to have a high hardness combined with excellent bearing properties. It's another case of a rare element finding its way into important applications in metallurgy and engineering.

## Steels for High Temperatures

**I**N THE IRON AGE of Aug. 3 there is a recital by Dr. F. M. Becket, president, Union Carbide and Carbon Research Laboratories, Long Island City, N. Y., of at least seven different general types of alloy steels for high-temperature service and it is impressive. Of course, chromium is the base metal for these steels, but he accords full recognition to the value of nickel in combination with chromium for definite purposes.

There are the 5 to 7 per cent chromium steels with small additions of tungsten or molybdenum; the 7 to 9 per cent chromium steels with aluminum or silicon, for valves in internal combustion engines, and the 12 per cent chromium steels of low-carbon content for turbine blades and valve stems. It is worth noting that he hints that the probable admixture of other elements will so improve this last-mentioned type as to render them applicable for even more severe conditions of temperature and corrosion.

Then comes the 18 per cent and even higher (20 to 30 per cent) chromium steels for resistance to oxidation at high temperatures. These can be distinctly improved by adding nickel, which increases strength and toughness and decreases grain growth and embrittlement—in certain combinations. Seamless tubes for temperatures as high as 1800 deg. F. are made of these steels. Next comes the

familiar 18 and 8 steels which are constantly finding wider uses. This partial array is climaxed by the 30 to 35 per cent and 15 to 20 per cent nickel alloy steels which, as castings, are pointed to as the strongest alloy steels for elevated temperatures.

Such a brief summarization as Dr. Becket's is actually prophetic of developments still to come.

## High-Chromium Steels Centrifugally Cast

**T**HE climax in Dr. Becket's address was the statement regarding "great progress" in the centrifugal casting of all the high-chromium steels. Labeling this a recent development, he said this process makes possible the casting of large tubes from compositions which at present cannot be fabricated into seamless tubing. By the centrifugal process larger tubes have been made than those obtainable from the high-chromium steels capable of being pierced into seamless tubes. Tubes have been centrifugally cast containing about 25 per cent chromium, 12 per cent nickel and 0.30 per cent carbon and having a diameter of 13 in., a wall thickness of  $\frac{5}{8}$  in. and a length of 12 ft. They are in use in a chemical process operating at 1000 deg. C (1832 deg. F).

The truly remarkable advances thus revealed remind one of the early work of DeLavaud in this country. It was the writer's fortune to visit this early pioneer in centrifugal casting of gray iron pipe when he was working with his first small machine at Buffalo some 18 years ago. As a result of this visit, the first article in an American magazine on the subject was published by THE IRON AGE. Today modifications of the DeLavaud process, and other similar processes, are turning out tons of centrifugally cast pipe each year.

## Ascents Into the Stratosphere

**T**WO modern developments have made possible that seemingly unattainable feat—ascend into the stratosphere. These are electro-metallurgy and welding. The famous Piccard ascents in the last two years could not even have been planned, were it not for these achievements. A light and strong metal was one of the first requisites. This has been furnished by the production commercially of magnesium and its alloys. These products possess unusual strength and lightness and are especially suited

to the ends desired. But adequate union of the various metal parts was absolutely essential to withstand all the strains and stresses involved in such an ascent with changing temperatures and pressures. This condition was met by advances in welding technique which made possible the union of the various metal sections into a sphere.

## New Swedish Iron for Radio Tubes

**A** NEW metal for electronic tubes has recently been introduced into this country. For the radio and similar industries, metals play an important role in successful transmission of sound by wireless. Metals employed in such tubes must have several outstanding properties—heat resistance, proper coefficient of expansion, non-corrosive qualities, low gas contents, weldability, easy workability and so on.

Nickel in certain forms meets these conditions quite satisfactorily. It is claimed, however, that a preparation of pure iron likewise meets the needs. Swedish metallurgists are offering a specially prepared pure iron under the name of "Svea" which is reported to be gaining wide use in competition with nickel.

The new iron, produced by a special metallurgical process, is pointed to as having high heat resistance, as being capable of carburization in plate form, as 10 per cent lighter than nickel, as giving correspondingly greater plate surface area for a given weight, and so on. Its specific gravity is 7.85 as compared with 8.60 for nickel and 8.91 for copper.

## Stainless Steels for Ship Bottoms

**A**N interesting announcement comes from Great Britain that tests are to be made to determine whether stainless steel will resist the adherence of barnacles. The 18 and 8 type is to be used in sheet form. One-third of the sheet will be left in the hot-rolled condition, part will be painted with ship paint, and the remaining portion is to be tested in the bright, smooth, or polished condition. Immersion for three months in barnacle-infested water is the plan. Engineers expect that barnacles will not adhere to the bright surface.

Possibly the result of these investigations will be a new use for stainless steels. If the stainless steels



prove effective in removing the barnacle nuisance, it is possible that the increased cost of the steel will be compensated for.

### A Special Cr-Wo Steel

THERE has been developed a special alloy steel containing about 6 per cent chromium and 1 per cent tungsten. One of the pioneers in the production of this alloy steel is the Chapman Valve Mfg. Co., Indian Orchard, Mass. This company has found this composition to have superior heat and corrosion resisting properties at high temperatures and it is incorporated in several types of Chapman valves. Its anti-creep value is reported as high and its ability to maintain strength and homogeneity at high temperatures and pressures is claimed eminently satisfactory.

Due to its high cost, tungsten is not widely used as an alloying element in the general run of alloy steels, except in high-speed steels, but results are found to justify it in this and similar cases.

### Explosions Prevented by Non-Sparking Tools

HAZARDS in the mining and in some other industries, owing to explosions from sparks from tools, bid fair to be eliminated soon, if the claims for a new alloy are borne out in practice. Chisels, hammers, cutters and other similar implements are being made of a beryllium-copper alloy which are said to be non-sparking under any conditions. These alloys contain 1.50 to 2.50 per cent beryllium with a hardness up to 325 to 375 Brinell, depending on the heat treatment and manufacturing conditions. It is said that these products can be made of this new non-ferrous alloy to the same dimensions as those of steel. The alloys have tensile strength of 155,000 lb. per sq. in. and higher depending on the treatment. Chisels made of them have successfully cut steel rivets.

### Lead-Coated Copper Now Available

THE representative of a large firm of architects stated to the writer recently that he favored lead in preference to some other metals for certain decorative and other uses in buildings. He was not enthusiastic about stainless steels.

A lead-coated copper has been put on the market for which some interesting claims are made. Recommended in particular for the use of architects, it is said to augment their range of expression, affording a wide variety of finishes and tones from "the metallic gray of newly cast lead to the soft weathered antiques, and from the

HERE are assembled a budget of comments on new things and methods in the materials field. Similar contributions were made by Mr. Cone in THE IRON AGE of July 13 and Aug. 24.

neatest of smooth surfaces to those that are extremely rough."

Several specific processes exist for coating copper with lead, the general principle in each case being the same. A proper bond between the two metals is essential. This and other requisites have been obtained by certain makers as the result of no little experience and painstaking research. If one reflects on the types and kinds of metals and alloys available today to architectural designers, the multitude and variety of these are well nigh bewildering.

### Special Cr-Mo Steels

A SPECIAL alloy steel for tubes for service at moderately low temperatures is having wide use and running into large tonnages. This steel contains about 6 to 8 per cent chromium and about 0.50 per cent molybdenum. Its comparative cheapness is in its favor as against the higher chromium and chromium-nickel steels which, however, are particularly adapted to service at the

more elevated temperatures. Both types of steels have made possible signal advances in the commercial production of gasoline and other chemical products.

In this connection announcement has been made recently of a similar steel (4.5 to 6.5 per cent Cr and 0.50 per cent Mo) for castings by a leading electric steel foundry in the East. High strength and resistance to corrosion, especially to that of hydrogen-sulphide gas at high temperatures, as in the oil industry, as well as a small creep factor, are among the points made for it.

### More Beryllium-Copper Soon Available

SO large has been the demand for the beryllium-copper (12.5 per cent Be) master alloy produced by the Beryllium Products Corp., New York, that measures have been taken to increase the output decidedly, at its plant at Marysville, Mich. There is much interest in the beryllium-copper products, both rolled and cast, now being made commercially by several American companies. The master alloy is also imported from Germany by the Metal & Thermit Corp., New York.

### Silicon As An Alloying Element

ANNOUNCEMENT of the early publication in book form of "The Alloys of Iron and Silicon" by the iron alloys committee of the Engineering Foundation of New York, emphasizes the extent to which silicon is an alloy in steel and iron. There are, for example, silicon structural steels, silicon electric steels and the silicon acid-resisting irons.

The silicon structural steels possess high strength with low cost, not much in excess of ordinary structural steels. The chief application of these steels, first widely used in Germany and England, has in the United States been in large modern bridges.

The remarkable magnetic properties of silicon electric steels, so well known, resulted by 1915 in a virtual revolution in the manufacture of electric machinery.

In the chemical industry the silicon acid-resisting irons are indispensable as used in the manufacture of sulphuric and nitric acids. They replace fragile glassware and costly platinum. Castings of this material contain usually about one part of silicon to six parts of iron.



# Normalizing Steel Castings

By WIRT S. SCOTT

Special Representative, Westinghouse Electric  
& Mfg. Co.

It is the general practice to speak of the heat treatment of steel castings as "annealing." This may or may not be correct when applied to a specific job. Some castings require annealing, some normalizing, depending upon the usage to which the castings must be applied.

Annealing implies restricted cooling at a rate slower than the normal rate. The charge is usually cooled in the furnace. This cooling may be for only 200 or 300 deg. F., or it may be until the charge is dead black in color.

Normalizing implies normal cooling, or "air quench." After the castings have been heated to the proper temperature, and held at that temperature (saturated) for 15 or 20 min. they are taken out of the furnace and allowed to cool in the air.

For maximum softness and ductility, the real genuine annealing with the slow cooling is the only solution. For these characteristics, strength and elasticity must be sacrificed. On the other hand, when strength and modified ductility are desired, the normalizing process must be used.

To secure dependable and satisfactory qualities in the steel castings, the heat treatment must be accomplished at an exact final or maximum tem-

perature throughout the entire charge. The curves of elastic limit, elongation and tensile strength increase with the temperature to some final value, depending upon the carbon content of the steel, and if the temperature is increased beyond a given and definite point, these values decrease at approximately the same rate.

To make the job still more difficult, none of these values reaches a maximum at the same time. For example, it may be perfectly satisfactory for *tensile strength* alone to allow for a maximum variation of 20 deg. C., plus or minus (36 deg. F.). Such variation will be working up and down on the slope of the curve of "elongation," and not at the crest. For maximum characteristics for both tensile strength and elongation, which are the usual requirements, one must work within closer limits of not over 10 deg. C. (18 deg. F.) plus or minus. Under these conditions one is working on the "tensile" curve from maximum to a decrease in the tensile strength as the temperature increases, and on the "elongation" curve, an increase to a maximum elongation under the same conditions.

For 0.26 per cent carbon steel the curve of tensile strength reaches its maximum at 940 deg. C. (1724 deg.

F.) and the curve of elongation reaches its maximum at 960 deg. C. (1760 deg. F.), hence a temperature variation not greater than 10 deg. C., plus or minus (18 deg. F.) is necessary.

All the characteristics previously mentioned are physical properties made necessary by the application. Where a casting is given a certain cross-section for the purpose of having the necessary tensile strength, it is absolutely a waste of good material (steel) to give that casting anything but proper heat treatment. What usually happens is this: A designing engineer will figure his stresses in a casting, and make it of a cross-section which, from his theoretical figures, will be sufficient. The casting fails in service. The engineer then increases the section of the casting.

What really should have been done was to have examined the heat treatment. Many castings now used could be reduced in weight anywhere from 20 to 40 per cent, by having proper heat treatment.

## Normalizing Sometimes Unnecessarily Expensive

THE normalizing of steel castings as practised by a great many plants, unknowingly, is a very expensive operation, all factors considered. If one is interested in reducing factory costs, there is no better place to begin than at the heat-treating furnace.

The normalizing (often spoken of as annealing) of steel castings is for the purpose of accomplishing one or more of the following results:

- Increasing the tensile strength
- Increasing the elongation
- Relieving strains
- Removing hard spots, and thereby increasing the machinability of the castings

Plants producing steel castings as a business, that is, not using the castings themselves, are mostly interested in how cheaply they can normalize the castings. Seldom, if ever, are they held to a high minimum ten-

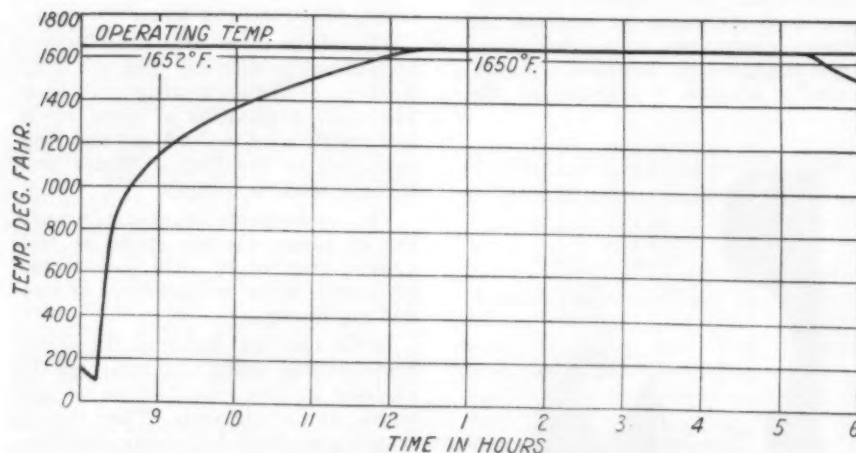


Fig. 1—Temperature control chart of the gas-fired car-type furnace, with control pyrometer in the middle of the furnace directly over the charge.



sile strength. It would seem, however, to their best interest to produce a casting of high and consistent tensile strength in order that their customers may design their castings accordingly. If a user of steel castings can depend upon being supplied with a casting of, say, 70,000 lb. tensile strength minimum, and can lighten by 10 to 15 or 20 per cent of the weight thereby, he certainly would be justified in paying a higher price for such castings.

Manufacturing plants purchasing normalized steel castings from an outside concern are interested chiefly in how cheaply they can buy their castings. One company was actually proud of the fact that it paid only \$1 a ton more for normalized castings.

The normalizing they were getting was expensive at \$1 a ton. They could have saved money by putting their castings out in the sun, and letting the sun shine on them as a normalizing process, which would be almost as effective as what they were getting. Few users of steel castings realize the extent to which they are penalizing themselves in increased factory costs in accepting anything but perfect normalizing. A casting that costs only \$1 a ton to normalize will cost from \$20 to \$30 more a ton before it is finished, due to such cheap heat treatment.

Most plants doing normalizing look upon the heat treating operation as an item of expense, something to be kept as low as possible, forgetting in their desire to reduce heating costs that the cost of heating may be only a fractional part of the total amount they are being penalized by disregarding the physical characteristics of the heat-treated product.

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**C**ERTAINTY as to what happens in the normalizing furnace in the treatment of steel castings is of paramount importance. Under sure control of the entire charge, one may establish a minimum variation, between castings or parts of castings, in respect to desired physical characteristics and machinability. The author reports at length on a notably complete investigation of natural-gas and electric furnace performance and finds that best results, operating cost included, were achieved with the electrically-heated unit.

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No manufacturer should hesitate to spend \$1,000 more in one department if by so doing he saves \$10,000 in some other department. It is true that the department saddled with the \$1,000 increase may not be at all enthusiastic about such a change, but it is during such times as these that some one at the head of the organization must decide what is good for the company as a whole.

#### Apparently Ideal Conditions That Were Faulty

A large manufacturing company operated a steel foundry as one of its departments. Castings weighing from a few ounces to several hundred pounds each were produced. No records of complaints were on file.

Everything seemed to be entirely satisfactory. Expert metallurgists were available for making any kind of physical test on the material that might be required. The product was under the supervision of the metallurgical department, and, in addition, a metallurgist was detailed to spend his entire time in this department.

A car-type furnace was used for normalizing. The car was 6 ft. wide by 15 ft. long, with a loading area of 4½ x 13 ft., and was designed for a charge of 16,000 lb. normal capacity. Natural gas was used for fuel, there being eight gas burners, four on each side of the furnace, all automatically controlled by a high-grade regulator and pyrometer.

Due to the fact that this furnace was of a high-grade construction, kept in first-class condition, was only nine months old, and gave a perfect, straight-line temperature control chart, it was considered as self-evident and a fact that the product was uniformly and correctly heat treated, and that should any variation in the physical properties occur, it must be in the metal, and not in the normalizing.

This particular furnace was considered as an ideal example of high-grade performance by combustion and metallurgical engineers, and an excellent furnace to use as a demonstration of what a correctly designed fuel furnace could do. The statement was unhesitatingly made that the furnace was performing entirely satisfactorily in every manner, that it was producing a product as good as any high-grade electric furnace could produce, and at one-half the cost.

Fig. 2—Results of sixth and last temperature distribution tests made on the gas furnace by means of 18 thermocouples for a period of several months.

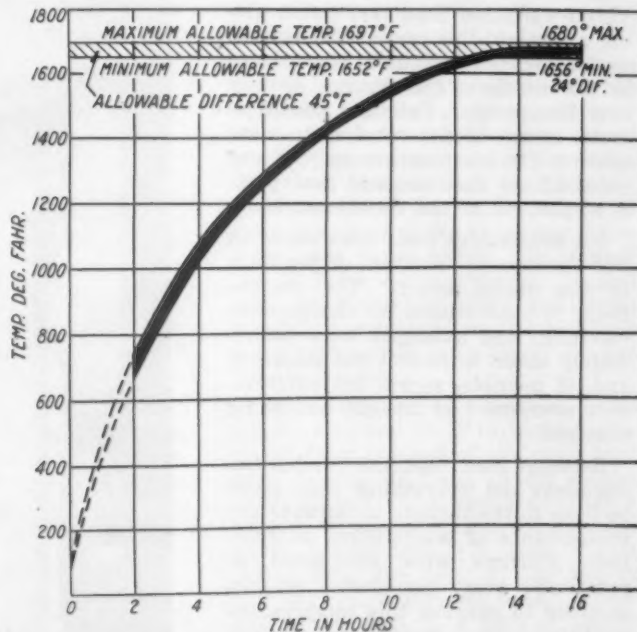
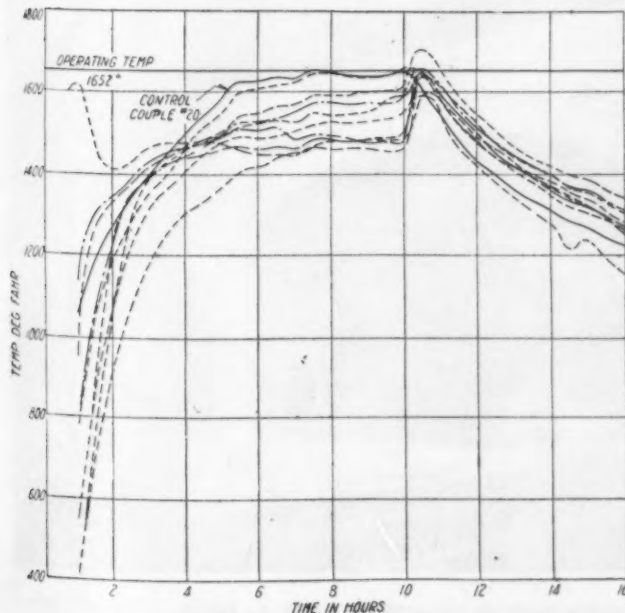


Fig. 3—In this chart of a test made in an electric car-type furnace, with a charge of 20,000 lb. of steel castings normalized, the solid black line represents the area enclosed by 12 thermocouples.

If the results herein described existed in this well-organized and supervised plant, and in connection with a new fuel furnace supposed to be an example of perfection, what must be the results in many plants when, admittedly, the conditions are less favorable?

#### Test Made With 18 Thermocouples

**T**HE heat treating specifications called for the charge being brought up and saturated at temperatures of not less than 900 deg. C. nor more than 925 deg. C., corresponding to 1652 and 1697 deg. F. respectively—or a maximum variation of 45 deg.

A temperature exploration test was made on this furnace. Special thermocouples embedded in test blocks 4 x 4 x 12 in. long were used. Many of the castings being heat treated were 4 in. thick; hence in order to determine when such castings were thoroughly saturated, it was necessary to embed the thermocouple in a block of the same corresponding thickness, to secure actual metal temperatures and not air temperatures.

The test was made with laboratory precision and every care exercised to obtain accurate temperature conditions from the charge. The test blocks with the thermocouples embedded were placed at various parts throughout the charge so as to obtain a thorough cross-sectional temperature exploration of the charge.

Fig. 1 is a reproduction of the temperature control chart recorded during the first test made on this furnace. It is a typical control chart of this particular furnace. This shows that the furnace came up to 1650 deg. F. and held with practically no visible variation from that point, giving a straight-line curve. The control pyrometer thermocouple was placed in the middle of the furnace directly over the charge. This fact should be borne in mind: A control instrument controls the temperature only at one point of the furnace; and that point is at the end of the thermocouple.

Six consecutive tests were made on this furnace, at intervals of ten days to two weeks apart. The results found to exist within the charge were startling, and attempts were immediately taken to correct the situation, and, if possible, secure the performance everyone had thought was being obtained.

Between each test, the combustion engineers did everything that could be done to the furnace to improve the performance of temperature distribution. Burners were readjusted in practically every conceivable manner in order to improve this temperature condition. The charge was raised higher up off of the hearth of the car, and was gradually reduced from a 16,000-lb. charge to a 9000-lb. charge in an attempt to improve the heat distribution conditions.

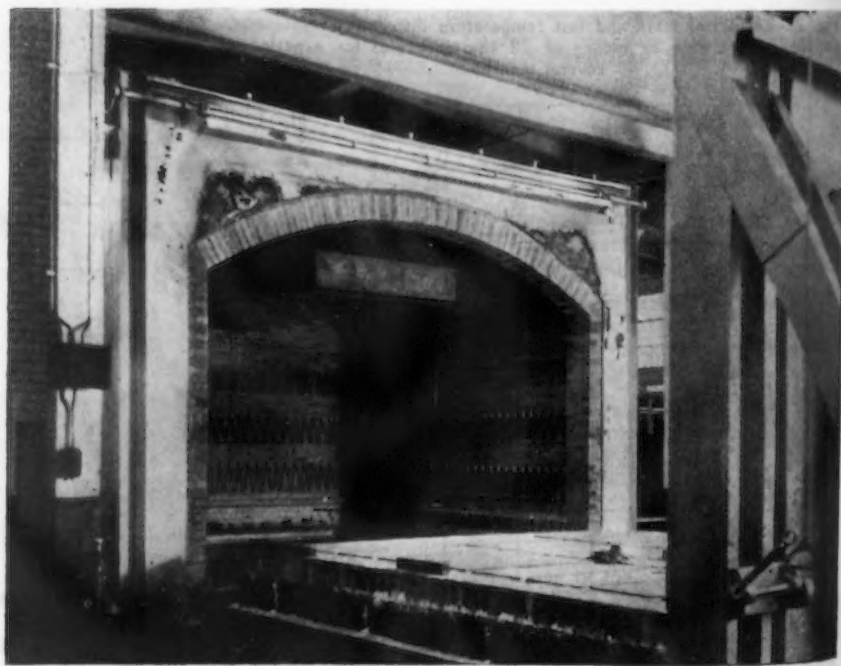
Fig. 2 is the result of the sixth and final test made on this furnace. Eighteen thermocouples were used, as formerly described. This chart shows the evenly numbered thermocouples, Nos. 2 to 18 inclusive. The chart of the odd-numbered thermocouples was plotted separately, and is substantially the same as this chart. As peculiar as it may sound, this last test was made at the request of the works department for the purpose of determining whether the furnace was good for *any kind* of heat treatment. Only one-seventeenth of the entire charge came within the temperature limits prescribed.

Prior to these tests, it was the belief of the metallurgist that with the 4-hr. soaking period to which the charge was subjected, the castings must come up to a constant and uniform temperature within that length of time.

An analysis of this curve plainly shows that the curves had assumed practically straight parallel lines and that if the heat treatment had been prolonged for a week the curves would be just as far apart, and they would never come together.

Physical tests on the test samples into which the thermocouples were embedded, showed tensile strength values from 50,000 lb. to 75,000 lb. per sq. in. Only one sample of the 18 specimens blocked actually came within the specifications of 70,000 to 76,000 lb. tensile strength.

In order to make a comparison with electric furnace performance, a carload of steel castings was sent to another part of the works where a large electrically-heated car-type furnace was available. The characteristics of this furnace are as follows: electrical capacity, 375 kw.; loading area of car, 14 x 15 ft.



Alloy cooling ducts are placed in the top of the furnace.

Fig. 3 shows the result of this test. The heavy line is the combined curve of 12 thermocouples, all contained within that area. During the entire final 2-hr. soaking period, the entire charge was within 12 deg. of 1652 deg. F. The tensile strength of the test samples varied from 73,000 to 76,000 lb. per sq. in. The test samples in each case were taken out of a steel block in which the thermocouples were embedded.

The test disclosed two very important matters for future consideration. The first point was that it was obvious that if in the heat treatment in the gas furnaces the steel castings varied in tensile strength from 50,000 lb. to 75,000 lb. then in their design a tensile strength of not more than 50,000 lb. per sq. in. could be considered as maximum, whereas, with the electric furnace, a tensile strength of 73,000 lb. could be used. In many castings this would mean that their weight could be lightened as much as 25 per cent.

The second consideration was that of the machinability of the castings. With the temperature variations within the castings as disclosed by the gas furnace test, it was obvious that machining difficulties were being experienced, and that more money was being spent for the machining of these castings than should be spent.

These things were all called to the attention of the superintendent of the foundry and to the metallurgist, but their reply was that they had had no difficulty in the past; therefore, there was no foundation for such an assumption.

Fortunately, one of these points could be definitely determined. Very accurate records were available as to the cost of machining these castings



which, of course, were normalized in the gas furnace. This cost consisted of every factor entering into machining cost of every casting, such as general and specific items of labor, tools and overhead.

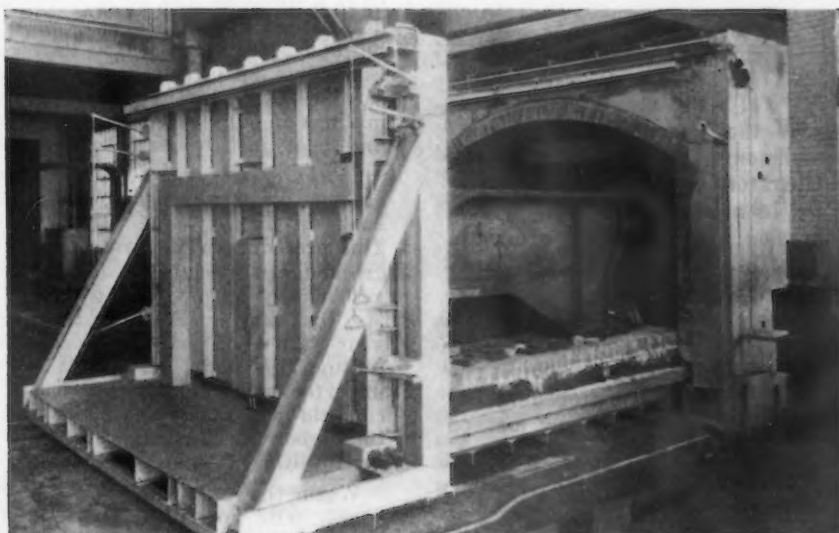
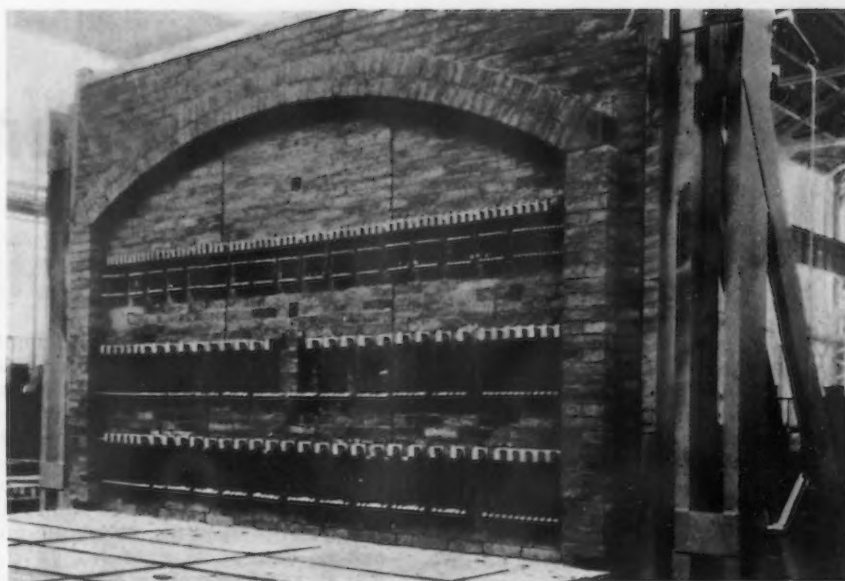
#### Investigate Cost of Machining

**E**ACH of the steel castings normalized in the electric furnace was marked for identification and a simi-

▲ ▲ ▲

*In the electric car-type furnace used for normalizing the steel castings, heating elements are placed on the side and rear walls, on the door, and in the car.*

▼ ▼ ▼



lar cost analysis was made by the manufacturing cost analysis department, as to the total overall cost of machining the castings heat treated in the electric furnace.

The result of this investigation was that a report made by the manufacturing cost analysis department to the works manager showed that if the castings were delivered to the various machining departments in the same conditions as existing with the present batch of castings normalized in the electric furnace, there would be an average saving of \$1.28 per 100 lb. of castings machined.

A joint cost analysis prepared by the representative of the works engineering department and the manufacturing cost analysis department showed the following astonishing results:

On the basis of 1c. electric power

and 30c. natural gas, for the heat treatment of the 16,000 lb. charge of steel castings, the gas cost would be \$14.60 and the electric power cost \$22.

On the basis of 300 charges per year the gas cost would be \$4,380 and the electric power cost \$6,600.

Using an electric furnace, the net savings in machining a 16,000 lb. charge of castings would be \$204.80; and for 300 charges per year, \$61,440 net saving in machining cost per year.

#### Summary

Per 100 lb. of castings normalized, gas cost 9c.; electric power, 14c.

Savings in machining cost per 100 lb., \$1.28, or 5c. additional spent for normalizing in an electric furnace will result in a saving of \$1.28 in machining costs.

## Bearing Hardness and Shake-out Time

**V**ARIATIONS in foundry practice in the manufacture of bearing bronzes appear to have little effect on the properties of bronzes of the same composition coming from different foundries, according to comprehensive tests conducted by Oscar E. Harder, assistant director, Battelle Memorial Institute, Columbus, Ohio, and Carter S. Cole, Copper and Brass Research Association, New York, and reported in a paper contributed to the American Foundrymen's Association. There was alone shown to be some relation between the shake-out time and the hardness.

In the case of the 70 copper, 10 tin and 20 lead alloys, the specimens that had been shaken out in a half hour were definitely harder than those which remained in the mold for 14 hr. The same tendency, but to a less degree, was shown for the 88 copper, 10 tin and 2 zinc and the 83 copper, 7 tin, 7 lead and 3 zinc alloys. As regards the 80-10-10 alloys (copper, tin and lead, respectively), there was practically no difference in the hardness for a variation of ½ to 7½ hr. for the time in the mold.

The hardness test specimens were 1½ in. long and 11/16 in. square, prepared from the end of the tests bars used for tensile tests. Tests at elevated temperatures were made with a 10-mm. tungsten carbide ball. At room temperature (75 deg. F.) a water bath was used; at 150 and at 250 deg. F., a glycerin bath; at 350 and at 450 deg. F., a bath of Fisher wax. The load was applied for one minute. Four diameters at 45 deg. apart were read on each impression, two tests made on each block, and three blocks from each manufacturer were tested.

# Determining Aluminum, Silicon and Chromium

**I**N the determination of oxides of aluminum, silicon and chromium in corrosion-resisting steels and plain steels, the steel samples must be heated high enough to insure that the chromium carbides are completely in solution. That is, the steel must not be in the annealed or partly annealed state. If it is in the latter condition, some or all of the Cr carbides will not dissolve in the sulphuric-nitric or sulphuric-H<sub>2</sub>O<sub>2</sub> solvent. The carbides will, therefore, interfere completely with any Cr<sub>2</sub>O<sub>3</sub> or Al<sub>2</sub>O<sub>3</sub> determinations.

The 5 per cent chromium steels, for example, should be heated to at least 1750 deg. Fahr. and held there about one-half hour or more and then cooled rapidly in the air. It may be necessary to water quench heavy sections or partly quench them to hasten cooling to prevent partial reprecipitation of Cr carbides.

The procedure then is: Dissolve 20 and 25 g. (for a check) of the steel in 800 ml. beakers with 10 ml. of 1:3 H<sub>2</sub>SO<sub>4</sub> per g. of drillings. Use thin drillings, or 20 mesh if possible, to speed the solution. Apply heat below boiling when action quiets down, and stir frequently if necessary, bringing finally to a boil to make sure that the heavier drillings are dissolved.

In high silicon steels, such as 18-8 with silicon of the order of 0.60 per cent and higher, the drillings may become coated with protective silicic films which require extra heat to break them down. Maintain original volume by adding distilled H<sub>2</sub>O during heating. Add more H<sub>2</sub>O if necessary, to prevent salting out.

When all action ceases, and if the steel contains any chromium, i.e., 0.20 per cent and over, the solution must be treated with 90 ml. of 1.20 nitric acid. If this acid is omitted, some of the chromium carbide will not be dissolved and will contaminate the insolubles. It will be counted as chromium oxide whereas it exists in the steel as carbides. If the nitric acid is not used on a 0.30 carbon stainless A, for example, the insoluble oxide residues are enormous. Copper, if present in amounts of about 0.09 and upward, requires the nitric treatment, also.

Hence, to the hot solution, add, from a dropping bottle, a little at a time, and with constant stirring 90 ml. of 1.20 sp. g. nitric acid. Add the nitric acid slowly, so that it is used up as

added. If added to the cold liquid, it will gather a head of nitrogen oxide gas and boil out of the beaker later when heated. Use great caution in adding the nitric acid. Shoot a jet of cold water into the beaker to quiet action when needed to prevent boiling over. Then heat until red fumes are gone. This requires about 10 min. and no longer; 25 g. of No. 73 U.S. 0.31 C, 13.9 per cent Cr steel will dissolve in 30 min.

The solutions are now ready for hot filtration. Then stir in a 7/8 in. diameter ball of wet ashless filter pulp and

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**W**ITH this article is completed the presentation in four installments of detailed chemical laboratory procedure developed by Dr. Johnson and published by permission of the executive department of the Crucible Steel Co. of America. These articles have painstakingly covered the difficulties of certain precise analyses, especially in respect to the corrosion-resisting steels. The preceding sections were: July 13, new method for molybdenum; Aug. 17, determining aluminum; Aug. 24, determining titanium. With these may be coupled a contribution by Dr. Johnson in THE IRON AGE of Feb. 12, 1931, on determining carbon.

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proceed to filter out the insolubles on to double 11 cm. No. 31 ashless filter papers. If silicon is high, a large amount of gel will be caught by the papers. Wash sixty times with hot 1:20 HCl, i.e. free of iron to KCNS, and the same number with hot H<sub>2</sub>O. Let each washing drain well before the next one is applied. Do not use suction during either filtering or washing, at any time. Wash free of ferrous or ferric test iron before gel extraction.

## Extraction of Siliceous Gel

Siliceous gel must be removed or high results will be obtained for silica. The best way to do this, completely, is not to pour the extractor

through the filter paper, at the start, but to lift out as far as possible, with a glass rod or jet, the mixture of pulp, gel and oxides. Place these on a clean watch glass, and cover to keep out dust. Also rinse off the remaining bits of pulp and oxide from the filter into a 5-in. porcelain dish with an H<sub>2</sub>O jet.

Next pour through the filter papers, from which the pulp was just removed, a filtered, nearly boiling, solution of 5 g. of anhydrous C.P. Na<sub>2</sub>CO<sub>3</sub> dissolved in 125 ml. H<sub>2</sub>O. This carbonate solution can be conveniently heated in a porcelain dish or casserole but do not heat in glass. Heat it to boiling and pour it through as described. Catch this hot filtrate in another casserole. Drop into this filtrate the mixture of pulp, oxides, and rinsings, and heat just to slow boiling with stirring.

Pour this extracted pulp and oxides back on to the same filters again. This procedure will extract all of the gel and remove largely, if not altogether, any Mo or W, especially the Mo, that may be present. Merely to pour the hot carbonate solution through the main gel results in an imperfect solution of the gel, and silicic acid will contaminate the silica, the higher the Si, the greater the error in SiO<sub>2</sub>.

Wash the pulp and oxides thoroughly with hot H<sub>2</sub>O. This may require as much as 60 well drained washings. Then wash likewise with 1:20 HCl and finally free of acid with H<sub>2</sub>O again.

## Determining Cr<sub>2</sub>O<sub>3</sub>

This mixture of pulp and oxides will now contain all of the insoluble Al<sub>2</sub>O<sub>3</sub>, Cr<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub> that were in the sample. Roast off these filters and pulp in weighted platinum crucibles. Then heat till all char is gone. If the ash is practically white, free from green tint or red, it is Al<sub>2</sub>O<sub>3</sub> and SiO<sub>2</sub>. Weigh as soon as room temperature is reached. Add a few drops of 1:3 H<sub>2</sub>SO<sub>4</sub> and 1 ml. HF. Evaporate dry; heat to low red and weigh again. Loss of weight represents the SiO<sub>2</sub>. Weight of SiO<sub>2</sub> free residue constitutes Al<sub>2</sub>O<sub>3</sub>. Check all weighings and average them to reduce errors. Carry the No. 55 U. S. Bureau plain steel standard which contains 0.0038 Al<sub>2</sub>O<sub>3</sub> all through to get blanks for all items.

If the Al<sub>2</sub>O<sub>3</sub> before removing SiO<sub>2</sub> does not look white but is greenish or



# Chromium Oxides

## in Corrosion-Resisting Steels

By DR. C. MORRIS JOHNSON  
Chief Chemist, Park Works, Crucible  
Steel Co. of America

a decided gray, then an appreciable amount of  $\text{Cr}_2\text{O}_3$  is present. This must be determined and deducted from the  $\text{Al}_2\text{O}_3$ . Therefore, fuse the residue, after removing  $\text{SiO}_2$ , at yellow heat sufficient to clear melt with 5 g. of C.P.  $\text{Na}_2\text{CO}_3$  mixed with 20 mg. of  $\text{KNO}_3$ .

As soon as clear melted, stop fusion at once to prevent attack of the crucible which would contaminate the melt with platinum. Dissolve the fusion in a small porcelain dish in as little water as possible. Filter the solution through a double 11 cm. ashless filter into 400 ml. beaker; wash with sodium carbonate-wash (3 g. per 500  $\text{H}_2\text{O}$ ), ten washings, keeping the volume of the filtrate and washings at 150 ml.

Compare this yellow chromate filtrate with 1, 2, 3, 4, 5 and 6 mg. of  $\text{K}_2\text{Cr}_2\text{O}_7$  dissolved in 150 ml.  $\text{H}_2\text{O}$  to which have been added 5 g.  $\text{Na}_2\text{CO}_3$ . In this way the  $\text{Cr}_2\text{O}_3$  present can be determined to the  $\frac{1}{2}$  mg. of  $\text{K}_2\text{Cr}_2\text{O}_7$  which, multiplied by the factor 0.5166, gives the number of milligrams of  $\text{Cr}_2\text{O}_3$ . This is deducted from the silica free weight of the  $\text{Al}_2\text{O}_3$ .

As the carbon and chromium contents increase, any Cr found in the insolubles is more likely to be in the steel as carbide rather than as oxide. The water insoluble on the filters is washed further at least fifty times with 3 g.  $\text{NH}_4\text{OH}$  + 500 ml.  $\text{H}_2\text{O}$ ; ignited, weighted, and deducted from the  $\text{Al}_2\text{O}_3$ , also. This final correction is for  $\text{Mn}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$ , if present.

### Eliminating Titanium

If there be titanium added to the steel, there may be some remaining in the steel. A considerable portion of the Ti may then contaminate the Si free  $\text{Al}_2\text{O}_3$  and  $\text{Cr}_2\text{O}_3$ . To correct for the  $\text{TiO}_2$ , fuse the silica free ash with 5 g. of C.P.  $\text{K}_2\text{S}_2\text{O}_7$  (fused) at a dull red heat for not over 5 min. or until clear melted. Prolonged fusing attacks platinum rhodium crucibles.

Dissolve the melt in a 400 ml. beaker in a mixture of 25 ml. 1:1 HCl and 25 ml.  $\text{H}_2\text{O}$ . Heat till clear dissolved. Remove crucible and lid from beaker, rinsing all surfaces into the solution. Sometimes  $\text{K}_2\text{S}_2\text{O}_7$  contains visible par-

ticles of hard glass embedded in the lumps. In such cases, filter these out through a small filter; wash with  $\text{H}_2\text{O}$ —twenty washings. The filtrate and washings are then peroxidized exactly as described, already, for Al in steel; boil; filter out titanium peroxide and any small amounts of oxides of iron and manganese that may be present.

The filtrate and washings can then be compared with dichromate standards to determine the  $\text{Cr}_2\text{O}_3$  as already described, if any shows by yellow color. Then the Al hydroxide is precipitated from the alkaline solution as given under the aluminum determination. The No. 55 should be carried right along with the analysis to get blanks to deduct from the  $\text{Al}_2\text{O}_3$ , any  $\text{Al}_2\text{O}_3$  found in No. 55 in excess of 0.0038 per cent.

### Separations By Fusion

The silica free ash can also be fused at a mild yellow heat until clear melted by mixing it with 5 g. of  $\text{Na}_2\text{CO}_3$  + 0.020 g. of  $\text{KNO}_3$ . Do not use blast but bring gradually to melting temperature to prevent spattering of imperfectly fused material on the lid. Hold at clear melted condition for 5 min. only.

Dissolve the cold melt in a porcelain dish with heat. Filter out the  $\text{H}_2\text{O}$  insoluble consisting of the Ti and a little Fe and any attacked platinum, mixing in a little ashless paper pulp. Wash this mixture with 2 g. of  $\text{Na}_2\text{CO}_3$  dissolved in 500  $\text{H}_2\text{O}$ , giving

about 40 washings. Catch the filtrate and washings in a 400 pyrex beaker. If these be yellow in color, then compare with dichromate, quantitatively, for Cr as already described in this  $\text{H}_2\text{SO}_4$  solution method, and calculate to  $\text{Cr}_2\text{O}_3$ . Call this filtered carbonate solution "A" and hold it.

Ignite the washed filter papers and mixture of pulp and Ti in the same crucible at a low red heat and repeat the fusion with 5 g. of  $\text{Na}_2\text{CO}_3$ ; cool; dissolve, filter and wash as before, getting filtrate and washings "B." Combine "A" with "B" and precipitate the Al therefrom as described under the aluminum in steel determination. The No. 55 should be carried along to get blanks in like manner.

This fusion method is probably the most convenient method when  $\text{Cr}_2\text{O}_3$  is to be determined but the separation of  $\text{Al}_2\text{O}_3$  from  $\text{TiO}_2$  by fusion must be always under suspicion that not all of the  $\text{Al}_2\text{O}_3$  has been completely separated from the  $\text{TiO}_2$ . Especially is this true if the the  $\text{TiO}_2$ ,  $\text{Al}_2\text{O}_3$  ash has been ignited at a high blast temperature. On the contrary, when the fusion is dissolved in hot 1:1 HCl, the clear solution is a guarantee that all  $\text{Al}_2\text{O}_3$  is in solution. In this case, however, the wet peroxidation separation must be used.  $\text{TiO}_2$  correction can also be made by  $\text{K}_2\text{S}_2\text{O}_7$  fusion of  $\text{Al}_2\text{O}_3$ ,  $\text{TiO}_2$ ; solution of melt in 50 ml. of boiling 1:3  $\text{H}_2\text{SO}_4$ ; cool, and make  $\text{H}_2\text{O}_2$  color determination.

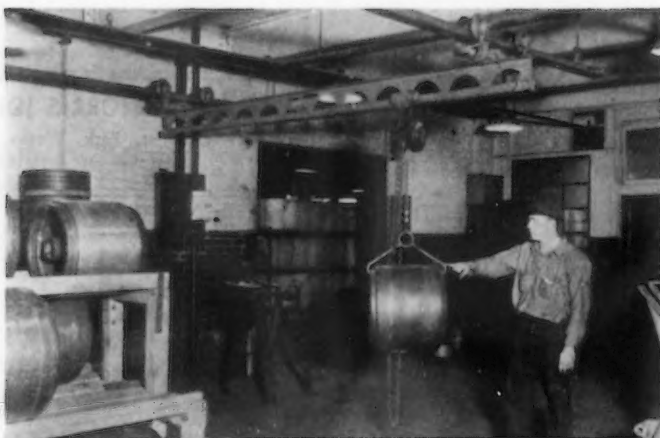
### Dissolving in Hydrochloric Acid

Solution of steel in dilute 2:1 HCl, a well known method for plain carbon steels, so far has not proved satisfactory for Cr alloy steels in this laboratory. It is slower in its dissolving action. The nitric acid decomposition of the carbides cannot be applied to the solution as the carbides must first be filtered out beforehand.

The tungsten constitutes a nuisance as it separates out whereas in the sulphuric acid methods it does not interfere up to 1.7 per cent, at least, in 0.15 per cent C, 4 to 6 per cent Cr steels. The Mo goes into solution, also in the  $\text{H}_2\text{SO}_4$ — $\text{HNO}_3$ , and in the  $\text{H}_2\text{SO}_4$ — $\text{H}_2\text{O}_2$  method.

(Continued on Page 60)





## Builds Light-Weight Cranes and Bridges

**C**LEVELAND Crane & Engineering Co., Wickliffe, Ohio, has announced a new line of cranes and transfer bridges of light weight, suitable for loads up to one ton where the bridge span is not over 16 ft. The bridges may be equipped with hand-propelled carriers, and may employ either a chain or a motor-operated hoist. The carrier operates on run-

ways of Cleveland Tramrail standard rail or arch beam, as shown in the accompanying illustration. The bridge is a section of Tramrail 8-in. arch beam rail, and standard one-ton hand-propelled carriers are used as the end trucks. The trucks are so keyed to the beam that misalignment is prevented. It is stated that the short wheel base of the end trucks and the 5-in. minimum bridge overhang will give exceptionally close approach to the ends of the runways as well as close bridge clearance.

## Determines Moisture Content of Sand

**F**OR determining rapidly the moisture content of molding sand, ganister, coal, coke, abrasives and other materials, the Alpha-Lux Co., Inc., 192 Front Street, New York, is offering the apparatus illustrated. It is stated that the moisture content of most materials can be ascertained correctly in from 1 to 2 min. The scale employed is sensitive to less than 5 mg. Materials can be tested at the point of use and either before or during processing.

In using the apparatus, the scale is first adjusted by raising and steadying the beam. The material to be tested is then weighed and poured into the container or shaker; next, ab-

sorbent powder, furnished with the tester, is poured into the cap of the container, the cap replaced, and the container shaken horizontally to thoroughly mix the sand or other material with the absorbent. After a short time the dial on the bottom of the container or shaker is observed, this dial indicating the weight percentage of the moisture.

## Pressed Steel Tank Co. Makes Beer Barrels

**PRESSED STEEL TANK CO.**, Milwaukee, has recently introduced the "Hackney" barrel for shipment of beer. These metal containers are said to possess a number of distinct advan-

Both the bilged and straight sided barrels are of seamless construction.



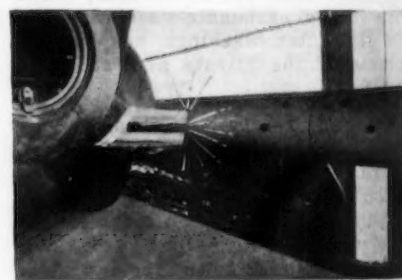
tages. Both the bilged type and the straight sided type are manufactured. The insulated bilged type has a double wall construction, and the straight sided barrel is equipped with extra combination rolling hoop and foot-ring.

Some of the advantages claimed for these kegs include: constant capacity, uniform weight, seamless construction that assures complete draining, easy cleaning and sterilization.

Linings or coatings can be of the type dictated by individual requirements. The finish of the above barrel is aluminum, but the manufacturers state that other colors can be obtained. The metal barrel permits name and address to be permanently embossed, or name plate attached. Tap bush and bung are any standard arrangement.

## New Highway Guard

**H**IGH-TENSILE steel features the construction of a new highway guard, designed and manufactured by the Tuthill Spring Co., 760 Polk Street, Chicago. This guard, which is intended to minimize road hazards by deflecting skidding vehicles, consists



of a 5/32 x 10-in. or 12-in. convexed steel member, mounted on a flat leaf supporting spring, fastened to the base of the post. The supporting spring is made of 7/14 x 4-in. special spring steel, which is claimed to have a tensile strength of 110,000 lb. per sq. in. Tests of the 5/32-in. x 10-in. guard rail are said to have shown an average tensile strength of 92,689 lb. per sq. in., with an average yield of 58,272 lb. per sq. in.





# Base Prices and Extras Applying to Principal Finished Steel Products

**B**ASE prices and extras on finished steel products, as filed by leading steel companies under the terms of the code, are herewith published for the first time in comprehensive form. While the information has been given THE IRON AGE by a number of individual companies, and is subject to possible slight modification, the data are essentially the same as will be published later in booklet form by the American Iron and Steel Institute. THE IRON AGE compilation will be reprinted to serve as a guide to buyers of steel while the official data are being prepared by the Institute. Extras on a number of products which have appeared in the last two issues of THE IRON AGE have again been printed with necessary revisions in order to make the presentation complete.

**S**TANDARDIZATION and reclassification of sizes, extras and differentials applying to finished steel products is expected to be one of the outstanding accomplishments to be achieved under the code. Heretofore, the various producers had issued individual cards of extras, which were in partial agreement, but which contained many discrepancies that were confusing to buyers and sellers alike. Base prices have varied from time to time and will continue to do so, because each company operating under the code is permitted to file new prices at any time. Changes in extras may also be filed, but with general standardization achieved, it is likely that revisions will occur only to recognize major changes in the requirements of buyers.

While the code of fair competition covers most of the business practices common to the industry, certain local and special conditions will be covered from time to time by the issuance of commercial regulations. The first of these regulations are summarized herewith, as also are general provisions of the code which are constantly applicable to the distribution of all forms of finished steel.

## Allowances on Products for Indirect Export

In the sale of manufactured articles for export, the steel industry has recognized that the cost of the steel in such products is often the determining factor in securing the business. Commercial regulation No. 6, therefore, provides under section 7, schedule E, of the code, that "allowances may be made by members of the code from the price of sheets that such members shall sell or contract to sell to manufacturers of steel drums located in the Pacific Coast States for export trade within the meaning of the term 'export trade,' as it is used in the Export Trade Act, and from the price of plates, shapes and bars and tin

plate such members shall sell or contract to sell for use by purchasers thereof in the manufacture of other articles for such export trade which shall be the smallest allowances that respectively shall be adequate in order to enable such member of the code to meet competitive conditions in the sale of such products, each such allowance to be promptly reported to the board of directors by the member of the code which shall have made it; provided, however, that no such allowance shall be made until such fabricated or manufactured articles shall have been shipped in such export trade."

## Port Switching Charges Established

Another regulation establishes 50c. a ton as a fair average of switching charges now in effect within the switching areas of the ports listed as basing points under schedule F of the code and provides that this charge shall be added to the base prices of steel products in making deliveries at Gulf or Pacific Coast ports.

## Delivered Prices Must Be Quoted

Delivered prices must be quoted by adding to the base price the all-rail published freight rate from the nearest basing point to destination in terms of all-rail freight rates. (Exceptions: rails, 60-lb. and heavier, and angle bars take an f.o.b. mill base, and track spikes and tie plates sold to railroad companies are quoted f.o.b. nearest basing point.)

When shipments are made to basing points, the delivered prices are computed by adding to the basing point prices the switching rate to destination.

If shipment is made by truck, a reduction in the all-rail delivered price may be made equivalent to 65 per cent of the carload all-rail published tariff freight charge from place of shipment to place of delivery. Trucking charges are to be paid by the buyer.

## Terms of Payment

The date of shipment will in all cases be the date of the invoice. Post-dating of invoices is not permitted by the code. Terms of payment are as set forth in Schedule G of the code.

## Chemical Analysis of Steel

Basic open-hearth, acid open-hearth and acid Bessemer steels will be made within standard ranges of chemical composition as shown in the tables. When specifications call for closer ranges extra charges will be imposed unless a combination of orders is so arranged that all steel coming within the standard ranges can be applied.

### Standard Ranges in Chemical Composition Based on Ladle Analysis

#### BASIC OPEN-HEARTH STEEL

CARBON	Standard Range Per Cent
Lowest maximum to be specified 0.10 per cent	
When minimum of range ordered is:	
Up to 0.20 per cent inclusive.....	0.05
From 0.21 to 0.50 per cent inclusive.....	0.10
From 0.51 to 0.95 per cent inclusive.....	0.15
From 0.96 to 1.40 per cent inclusive.....	0.20

#### MANGANESE

Lowest maximum to be specified 0.40 per cent	
When minimum of range ordered is:	
Up to 0.35 per cent inclusive.....	0.15
From 0.36 to 0.60 per cent inclusive.....	0.20
From 0.61 to 1.20 per cent inclusive.....	0.30
From 1.21 to 1.60 per cent inclusive.....	0.35

#### PHOSPHORUS

Lowest maximum to be specified 0.04 per cent	
When minimum of range ordered is:	
Up to 0.04 per cent inclusive.....	0.02
From 0.041 to 0.05 per cent inclusive.....	0.025
From 0.051 to 0.075 per cent inclusive.....	0.03

#### SULPHUR

Lowest maximum to be specified 0.05 per cent	
When minimum of range ordered is:	
Up to 0.075 per cent inclusive.....	0.07
From 0.076 to 0.10 per cent inclusive.....	0.08

#### SILICON

When minimum of range ordered is:	
Up to 0.14 per cent inclusive.....	0.10
From 0.15 to 0.24 per cent inclusive.....	0.15
From 0.25 to 0.40 per cent inclusive.....	0.20
From 0.41 to 1.80 per cent inclusive.....	0.40

#### COPPER

Minimum only to be specified.

#### ACID OPEN-HEARTH STEEL

CARBON	Standard Range Per Cent
Lowest maximum to be specified 0.10 per cent	
When minimum of range ordered is:	
Up to 0.20 per cent inclusive.....	0.05
From 0.21 to 0.50 per cent inclusive.....	0.10
From 0.51 to 0.95 per cent inclusive.....	0.15
From 0.96 to 1.40 per cent inclusive.....	0.20

#### MANGANESE

Lowest maximum to be specified 0.45 per cent	
When minimum of range ordered is:	
Up to 0.35 per cent inclusive.....	0.15
From 0.36 to 0.60 per cent inclusive.....	0.20
From 0.61 to 1.20 per cent inclusive.....	0.30
From 1.21 to 1.60 per cent inclusive.....	0.35

#### PHOSPHORUS

Lowest maximum to be specified 0.05 per cent	
---	--

#### SULPHUR

Lowest maximum to be specified 0.05 per cent	
---	--

#### SILICON

When minimum of range ordered is:	
Up to 0.14 per cent inclusive.....	0.10
From 0.15 to 0.24 per cent inclusive.....	0.15
From 0.25 to 0.40 per cent inclusive.....	0.30
From 0.41 to 1.80 per cent inclusive.....	0.40

#### COPPER

Minimum only to be specified

#### ACID BESSEMER STEEL

CARBON	Standard Range Per Cent
Lowest maximum to be specified 0.08 per cent	
When minimum of range ordered is:	
Up to 0.10 per cent inclusive.....	0.05
From 0.11 to 0.40 per cent inclusive.....	0.10
From 0.41 to 0.60 per cent inclusive.....	0.15
From 0.61 to 0.75 per cent inclusive.....	0.20

#### MANGANESE

Lowest maximum to be specified 0.40 per cent	
When minimum of range ordered is:	
Up to 0.35 per cent inclusive.....	0.15
From 0.36 to 0.60 per cent inclusive.....	0.20
From 0.61 to 1.20 per cent inclusive.....	0.30
From 1.21 to 1.60 per cent inclusive.....	0.35

#### PHOSPHORUS

Lowest maximum to be specified 0.11 per cent	
---	--

#### SULPHUR

Lowest maximum to be specified 0.06 per cent	
When minimum of range ordered is:	
Up to 0.075 per cent inclusive.....	0.07
From 0.076 to 0.10 per cent inclusive.....	0.08
From 0.101 to 0.20 per cent inclusive.....	0.10

#### SILICON

When minimum of range ordered is:	
Up to 0.14 per cent inclusive.....	0.10
From 0.15 to 0.24 per cent inclusive.....	0.15
From 0.25 to 0.40 per cent inclusive.....	0.20

#### COPPER

Minimum only to be specified

## Revised Size Extras on Semi-Finished Steel

#### BILLETS, BLOOMS AND SLABS (REROLLING QUALITY)

Billets, blooms and slabs, rerolling quality, are quoted at \$26 a gross ton f.o.b. the following basing points: Pittsburgh, Buffalo, Cleveland, Chicago, Gary, Ind., Birmingham and Youngstown.

#### BILLETS, BLOOMS AND SLABS (FORGING QUALITY)

Billets, blooms and slabs, forging quality, are quoted at \$31 a gross ton f.o.b. the following basing points: Pittsburgh, Buffalo, Cleveland, Chicago, Gary, Birmingham and Youngstown. Sizes smaller than 4 x 4 in. are to be sold on a bar basis only, subject to bar card extras.

#### SHEET BARS

Sheet bars are quoted at \$26 a gross ton f.o.b. the following basing points: Pittsburgh, Buffalo, Cleveland, Chicago, Youngstown and Canton. No size extras apply. Standard extras for chemistry are shown in the table of semi-finished steel extras.

#### SKELP

Skelp groove-rolled, universal or sheared, is quoted at 1.60c a lb. (net, no extras) f.o.b. the following basing points: Pittsburgh, Buffalo, Chicago, Youngstown, Coatesville, Pa., and Sparrows Point, Md.



### Classification of Extras on Semi-Finished Steel

B'ooms, Billets, Slabs and Sheet Bars  
(Bessemer and Open-Hearth Steel)

Extras per Gross Ton to be Added to the Base Price

#### EXTRAS FOR SIZE

To be added to base price for rerolling and forging quality billets:

Squares under 4 x 4 in. to 1½ x 1½ in., inclusive or rectangular sections of equivalent area.....	\$1.00
4 x 4 in. to 9 x 9 in., inclusive, or equivalent area..	No extra
Over 9 x 9 in. to under 14 x 14 in. or equivalent area..	\$2.00
14 x 14 in. to under 16 x 16 in. or equivalent area..	4.00
16 x 16 in. to under 20 x 20 in. or equivalent area..	6.00
20 x 20 in. and over or equivalent area.....	8.00
Weight per piece when ordered 12,000 lb. or over..	10.00

(This shall not apply when product of ingot is accepted)

#### EXTRAS FOR QUALITY

Special requirement quality or carburizing quality.. \$5.00  
(To be added to base price for forging quality billets)

#### EXTRAS FOR CHEMICAL SPECIFICATIONS

##### CARBON

(The mean of the range agreed upon between purchaser and manufacturer shall determine the extra)

Open-Hearth	0.10/.025 per cent.....	No extra
Bessemer	0.08/0.25 per cent.....	
	0.26/.060 per cent.....	\$1.00
	0.61/1.25 per cent.....	3.00

When maximum specified is:

Open-Hearth	0.09	
	0.07.....	\$1.00

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## MANGANESE

(The mean of the range agreed upon between purchaser and manufacturer shall determine the extra)

0.30/0.90 per cent.....	No extra
0.91/1.15 per cent.....	\$2.00
1.16/1.35 per cent.....	4.00
1.36/1.50 per cent.....	5.00
1.51/2.00 per cent.....	13.00

NOTE: For manganese content above a mean of 1.15 per cent the above extras apply only to steel with maximum carbon specified 0.20 per cent or higher. Prices for exceptions made by this note will be quoted on application.

## SILICON

(The mean of the range agreed upon between purchaser and manufacturer shall determine the extra)

Minimum not specified .....	No extra
Up to 0.25 per cent inclusive.....	\$2.00
0.26 to 0.50 per cent inclusive.....	4.00

## PHOSPHORUS

Minimum not specified .....	No extra
0.04 per cent minimum to 0.08 per cent minimum.....	\$1.00

NOTE: Phosphorus extra applies to open-hearth steel only. Phosphorus extra does not apply to sheet bars.

## SULPHUR

Minimum not specified.....	No extra
0.07 per cent minimum to 0.10 per cent minimum.....	\$2.00
0.11 per cent minimum to 0.20 per cent minimum.....	3.00
0.21 per cent minimum to 0.30 per cent minimum.....	5.00

## COPPER

Copper content 0.20/0.30 per cent.....	\$1.00
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## Rails and Track Supplies

### HEAVY RAILS

Steel rails, 60-lb. and heavier, along with angle bars and rail joints, take an f.o.b., mill base, being the only finished steel products to be so sold. Heavy rails are unchanged in price at \$40 a ton. On lots of 25 to 499 tons, an extra of \$2 a ton is applied, while an order for less than 25 tons is assessed \$4 a ton extra. Other extras on rails are essentially unchanged.

### LIGHT RAILS

Light rails are quoted at \$32 a gross ton, base Pittsburgh, Chicago or Birmingham. A deduction of \$1 a ton may be allowed for rerolling quality, manufactured from rerolling rails. It is permissible to sell not exceeding 10 per cent of total production in rerolled quality as seconds at \$2 a ton below the base rate. For fabricating quality an extra of \$2 a ton is charged.

Those determined by the code to be jobbers may be allowed brokerage fees or commission on direct shipments from the mill to the consignee not to exceed \$1 a ton. This allowance will not apply to tonnage shipped to jobbers' stocks.

### Deductions and Extras for Light Rails

SECTION EXTRAS	Per Gross Ton
25 to 45-lb. inclusive .....	Base
50 to 60-lb. inclusive .....	\$5.00
16-lb. and 20-lb. ....	1.00
12-lb. ....	2.00
8 and 10-lb. ....	5.00

### QUALITY EXTRAS

Carload lots—20 gross tons, minimum .....	Base
Under 20 gross tons to 5 gross tons inclusive.....	\$1.00
Under 5 gross tons .....	2.00

### EXTRAS FOR LENGTHS

30-ft. with 10 per cent of shorts down to 20 ft. inclusive ....	Base
All 30-ft. lengths .....	\$1.00
All cut lengths under 30 ft. to and including 12 ft. ....	2.00
Cut lengths under 12 ft. ....	5.00

### EXTRAS FOR BONDING

One hole in web of each end of rail .....	\$1.00
Two holes in web of each end of rail .....	2.00

### EXTRAS FOR FLANGE DRILLING

One hole in flange of each end of rail .....	\$2.00
Two holes in flange of each end of rail .....	4.00

### EXTRAS FOR NOTCHING

Notching flange of rail for spikes .....	\$2.00
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## TIE PLATES

Tie plates are quoted at \$38 a net ton, f.o.b. following basing points: Pittsburgh, Chicago, Birmingham, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Buffalo, and Steelton, Pa. They are quoted \$40 per net ton f.o.b. cars on dock at Pacific Coast ports. Subject to extras per standard classification of extras on rolled steel tie plates.

### Standard Extras on Tie Plates

	Extra Per Net Ton
Soft, medium and hard grades, ordered to standard specifications for steel tie plates, adopted by the Association of American Steel Manufacturers on Feb. 21, 1923 .....	No Extra
When specified:	
Carbon 0.30/0.60 per cent .....	\$1.00
Carbon 0.61 per cent or over .....	3.00
Copper up to 0.20 per cent minimum .....	2.00
Silicon 0.15/0.30 per cent .....	2.00
Special designs, workmanship, chemical or physical requirements .....	Extra upon Application

### QUANTITY:

	No Extra
20 net tons and over .....	\$3.00
Under 20 net tons to 10 net tons .....	6.00
Under 10 net tons to 5 net tons .....	15.00
Under 5 net tons to 2 net tons .....	40.00

## RAILROAD TRACK SPIKES

Railroad track spikes are quoted at 2.40c. a lb. base f.o.b. the following basing points: Pittsburgh, Chicago, Birmingham, Youngstown, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Philadelphia, Lebanon, Pa., Columbia, Pa., Richmond, Va., Jersey City, N. J. Subject to extras per standard classification of extras on spikes.

### Standard Extras on Track Spikes

SIZE (All lengths measured under the throat)	Per 100 lb.
9/16 x 4 1/2 and larger, up to and including	No Extra
5/8 x 4 1/2 in. ....	\$0.25
1/2 x 5 in. ....	0.25
4 1/2 in. ....	0.25
4 in. ....	0.50
3 1/2 in. ....	0.50
3 in. ....	0.65
7/16 x 4 1/2 in. ....	0.65
4 in. ....	0.65
3 1/2 in. ....	0.75
3 in. ....	0.90
5/8 x 4 1/2 in. ....	0.90
4 in. ....	0.90
3 1/2 in. ....	0.90
3 in. ....	1.15
2 1/2 in. ....	1.25
2 in. ....	1.70
5/16 x 3 1/2 .....	1.70
3 in. ....	1.70
2 1/2 in. ....	1.70
2 in. ....	1.70
High carbon open-hearth (Min. 0.30 per cent carbon)	0.05
Copper-bearing, up to 0.20 minimum.....	0.10
Goldie points .....	0.15
Special designs, minimum.....	0.15
Shimming spikes .....	0.15
Reverse points .....	0.25
100-lb. kegs .....	0.10

### QUANTITY

	No Extra
200 kegs and over.....	0.10
100 kegs to 199 kegs, inclusive.....	0.25
25 kegs to 99 kegs, inclusive.....	0.50
24 kegs and under.....	



# Chicago Base Lower on Heavy Hot-Rolled Steel

## Merchant Bars and Small Shapes

Merchant bars and small shapes are quoted at 1.60c., Pittsburgh; 1.65c., Gary, Chicago or Cleveland; 1.70c., Buffalo; 1.75c., Birmingham; 2.00c., f.o.b. cars on dock, Gulf ports, and 2.15c., f.o.b. cars on dock, Pacific Coast ports. The same prices apply on tube rounds at Pittsburgh, Buffalo, Chicago, Cleveland and Birmingham. Small shapes are identified as angles, channels and tees with greatest thickness less than  $\frac{1}{4}$  in. and greatest dimension less than 3 in. The base prices are subject to all extras, according to standard classification of extras covering those products.

Size extras, to be added to the base price per lb. have been subject only to minor changes. As heretofore, the next higher extra applies to intermediate sizes. These extras are as follows:

### ROUNDS AND SQUARES

	Base
$\frac{3}{4}$ to $3\frac{1}{8}$ in.	0.10c.
$\frac{5}{8}$ to $1\frac{1}{8}$ in.	0.15c.
$\frac{3}{4}$ in.	0.20c.
$\frac{1}{2}$ in.	0.30c.
$\frac{3}{8}$ in.	0.40c.
$\frac{1}{4}$ in.	0.55c.
$\frac{3}{16}$ in.	0.70c.
$\frac{9}{32}$ in.	0.85c.
$\frac{1}{4}$ in.	1.00c.
$\frac{15}{64}$ in.	1.25c.
$\frac{7}{32}$ in.	1.50c.
$\frac{1}{2}$ in.	2.00c.
$3\frac{1}{2}$ to $3\frac{3}{4}$ in.	0.10c.
$3\frac{3}{4}$ to $4\frac{1}{4}$ in.	0.15c.
$4\frac{1}{4}$ to $4\frac{3}{4}$ in.	0.25c.
$4\frac{3}{4}$ to $5\frac{1}{4}$ in.	0.35c.
$5\frac{1}{4}$ to $5\frac{3}{4}$ in.	0.45c.
$5\frac{3}{4}$ to $6\frac{1}{4}$ in.	0.55c.
$6\frac{1}{4}$ to $6\frac{3}{4}$ in.	0.65c.
$6\frac{3}{4}$ to $7\frac{1}{4}$ in.	0.75c.
$7\frac{1}{4}$ to $7\frac{3}{4}$ in.	0.85c.
$7\frac{3}{4}$ to 8 in.	1.10c.

### FLATS

#### Thickness in Inches

Width in Inches	4 to $3\frac{1}{8}$	3 to $2\frac{1}{8}$	2 to $1\frac{1}{8}$	1 to $\frac{3}{4}$	$\frac{3}{4}$ to $\frac{1}{2}$	$\frac{1}{2}$ to $\frac{3}{8}$	$\frac{3}{8}$ to $\frac{1}{4}$
$\frac{3}{8}$	....	....	....	....	....	1.00	1.40
$\frac{1}{2}$	....	....	....	....	....	0.70	0.90
$\frac{5}{8}$	....	....	....	....	0.50	0.50	0.75
$\frac{3}{4}$ to $1\frac{1}{8}$	....	....	....	....	0.40	0.40	0.60
$\frac{3}{4}$ to $1\frac{1}{8}$	....	....	....	0.20	0.20	0.20	0.30
1 to $1\frac{1}{8}$	....	0.10	Base	Base	Base	Base	0.15
$1\frac{1}{8}$ to 2	....	0.10	Base	Base	Base	Base	0.15
$2\frac{1}{8}$ to $2\frac{1}{2}$	....	0.20	0.10	Base	Base	Base	0.15
$2\frac{1}{2}$ to 3	....	0.20	0.10	Base	Base	Base	0.15
$3\frac{1}{8}$ to $3\frac{1}{2}$	0.30	0.20	0.10	Base	Base	Base	0.15
$3\frac{1}{2}$ to 4	0.30	0.20	0.10	Base	Base	Base	0.15
$4\frac{1}{8}$ to 5	0.30	0.20	0.10	Base	Base	Base	0.15
$5\frac{1}{8}$ to 6	0.30	0.20	0.10	Base	Base	Base	0.15

### EQUAL LEG ANGLES

4 x 4 x $\frac{1}{8}$ in.	0.30c.
$3\frac{1}{2}$ x $3\frac{1}{2}$ x $\frac{1}{8}$ in.	0.30c.
3 x 3 x $\frac{1}{8}$ in.	0.35c.
3 x 3 x $\frac{1}{4}$ in.	0.50c.
$1\frac{1}{2}$ x $1\frac{1}{2}$ and wider, but under 3 in. wide x $\frac{1}{8}$ in. and heavier.	0.15c.
$1\frac{1}{2}$ x $1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{1}{8}$ in.	0.25c.
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{8}$ in. and heavier.	0.25c.
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{4}$ in.	0.30c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{8}$ in.	0.35c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{4}$ in.	0.40c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{2}$ in.	0.45c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{3}{4}$ in.	0.60c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $1\frac{1}{2}$ in.	1.50c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $3\frac{1}{2}$ in.	2.00c.
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{8}$ in.	2.20c.
$\frac{1}{2}$ x $\frac{1}{2}$ x less than $\frac{1}{8}$ in.	2.50c.

### UNEQUAL LEG ANGLES

4 x 3 x $\frac{1}{8}$ in.	0.30c.
$3\frac{1}{2}$ x 3 x $\frac{1}{8}$ in.	0.30c.
$3\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{8}$ in.	0.30c.
$3\frac{1}{2}$ x 2 x less than $\frac{1}{4}$ in.	0.35c.
3 x $2\frac{1}{2}$ x less than $\frac{1}{4}$ in.	0.35c.
3 x 2 x less than $\frac{1}{4}$ in.	0.35c.
$2\frac{1}{2}$ x 2 x $\frac{1}{2}$ to $\frac{1}{8}$ in. incl.	0.15c.
$2\frac{1}{2}$ x 2 x $\frac{1}{4}$ in.	0.25c.
$2\frac{1}{2}$ x $1\frac{1}{4}$ x $\frac{1}{8}$ in. to $\frac{1}{8}$ in. incl.	0.20c.
$2\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{2}$ to $\frac{1}{8}$ in. incl.	0.20c.
$2\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{2}$ to $\frac{1}{8}$ in. incl.	0.20c.
2 x $1\frac{1}{2}$ x $\frac{3}{8}$ to $\frac{1}{8}$ in. incl.	0.15c.
2 x $1\frac{1}{2}$ x $\frac{1}{4}$ in.	0.25c.
2 x $1\frac{1}{2}$ x $\frac{3}{8}$ to $\frac{1}{8}$ in. incl.	0.20c.
2 x 1 x $\frac{1}{8}$ in.	0.30c.
2 x 1 x $\frac{1}{4}$ in.	0.40c.
$1\frac{3}{4}$ x $1\frac{1}{4}$ x $\frac{1}{4}$ to $\frac{1}{8}$ in. incl.	0.25c.
2 x $1\frac{1}{2}$ x $\frac{1}{4}$ to $\frac{1}{8}$ in. incl.	0.15c.
1 $\frac{3}{8}$ x $\frac{7}{8}$ x $\frac{1}{8}$ in.	0.35c.
1 $\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{4}$ in.	0.40c.
1 x $\frac{5}{8}$ x $\frac{1}{8}$ in.	0.50c.
1 x $\frac{3}{8}$ x $\frac{1}{4}$ in.	0.60c.

Other unequal leg angles take extras of equal leg angles of the short dimensions.

### CHANNELS

$1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{1}{8}$ in. and heavier	0.25c.
$1\frac{1}{2}$ in. and wider, but under 3 in. wide x $\frac{1}{4}$ in.	0.40c.
$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{8}$ in. (special box channel)	0.40c.
1 to $1\frac{1}{4}$ x $\frac{1}{8}$ in. and heavier.	0.40c.
1 to $1\frac{1}{4}$ x $\frac{1}{4}$ in.	0.50c.
1 to $1\frac{1}{4}$ x $\frac{3}{4}$ in.	0.70c.
$\frac{3}{4}$ and $\frac{7}{8}$ x $\frac{1}{8}$ in. and over.	0.50c.
$\frac{3}{4}$ and $\frac{7}{8}$ x $\frac{1}{4}$ in.	0.60c.
$\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{3}{4}$ in.	0.80c.
$\frac{3}{4}$ x $1\frac{1}{32}$ x $\frac{3}{32}$ in.	1.00c.
$\frac{3}{4}$ x 15 gage and $\frac{5}{64}$ in.	1.00c.
$\frac{5}{8}$ x $\frac{1}{4}$ in. and over.	1.70c.
$\frac{5}{8}$ x $\frac{1}{8}$ x $\frac{1}{8}$ in.	1.70c.
$\frac{5}{8}$ x $\frac{3}{32}$ in.	2.00c.
$\frac{1}{2}$ x $\frac{3}{4}$ in. and over.	2.50c.
$\frac{1}{2}$ x $\frac{5}{64}$ in.	3.00c.

### TEES

$1\frac{1}{2}$ x $1\frac{1}{2}$ in. and wider, but under 3 x $\frac{1}{8}$ in. and over	0.30c.
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{8}$ in. and over.	0.55c.
1 x 1 to $1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{4}$ in.	0.70c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{8}$ in.	0.70c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{4}$ in.	0.90c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{2}$ in.	0.90c.
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{3}{4}$ in.	1.10c.
$\frac{5}{8}$ x $\frac{5}{8}$ x $\frac{1}{8}$ in.	1.80c.
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{4}$ in.	2.50c.

Unequal tees are subject to special prices.

### HEXAGONS

1 $\frac{1}{8}$ to $5\frac{1}{8}$ in.	0.25c.
$\frac{3}{4}$ to $1\frac{1}{8}$ in.	0.125c.
$\frac{5}{8}$ to $\frac{1}{2}$ in.	0.20c.
$\frac{1}{2}$ to $\frac{3}{8}$ in.	0.35c.
$\frac{3}{8}$ in.	0.60c.
$\frac{1}{2}$ in.	0.90c.
$\frac{3}{4}$ in.	1.20c.
$\frac{1}{2}$ in.	1.50c.

### OVALS

$\frac{3}{4}$ to $2\frac{1}{2}$ x $\frac{3}{8}$ in. and over.	0.30c.
$\frac{3}{4}$ to $2\frac{1}{2}$ x $\frac{1}{4}$ to $\frac{1}{8}$ in.	0.40c.
$\frac{3}{4}$ to $2\frac{1}{2}$ x $\frac{5}{32}$ to $\frac{1}{8}$ in.	0.70c.
$\frac{5}{8}$ to $\frac{1}{2}$ x $\frac{1}{8}$ in. and over.	0.50c.
$\frac{5}{8}$ to $\frac{1}{2}$ x $\frac{1}{4}$ to $\frac{1}{8}$ in.	0.70c.
$\frac{5}{8}$ to $\frac{1}{2}$ x $\frac{1}{4}$ to $\frac{5}{32}$ in.	1.00c.
$\frac{1}{2}$ to $\frac{3}{8}$ x $\frac{1}{4}$ in. and over.	1.00c.
$\frac{1}{2}$ to $\frac{3}{8}$ x $\frac{1}{4}$ to $\frac{1}{8}$ in.	1.30c.
$\frac{1}{2}$ to $\frac{3}{8}$ x $\frac{5}{32}$ in.	1.60c.
$\frac{3}{8}$ to $\frac{1}{2}$ x $\frac{1}{8}$ in. and over.	1.60c.
$\frac{3}{8}$ to $\frac{1}{2}$ x $\frac{1}{4}$ to $\frac{5}{32}$ in.	2.00c.
$\frac{3}{8}$ to $\frac{1}{2}$ x $\frac{3}{32}$ in.	2.40c.

## HALF OVALS

1 to 4 x 1/4 in. and over.....	0.40c.
1 to 4 x Nos. 7, 8, 9 and 1/8 in.....	0.50c.
1 to 4 x Nos. 10, 11, 12 and 3/8 in.....	0.70c.
3/4 to 1 1/8 x 1/8 in. and over.....	0.70c.
3/4 to 1 1/8 x Nos. 10, 11, 12 and 1/8 in.....	0.90c.
3/4 to 1 1/8 x Nos. 13, 14 and 15.....	1.20c.
3/4 to 1 1/8 x 3/32 in. and over.....	0.90c.
3/4 to 1 1/8 x Nos. 10, 11, 12 and 1/8 in.....	1.20c.
3/4 to 1 1/8 x Nos. 13, 14 and 15.....	1.40c.
1/2 to 3/8 x 1/8 in. and over.....	1.20c.
1/2 to 3/8 x Nos. 13, 14 and 15.....	1.60c.
3/8 to 1/2 x 3/32 in. and over.....	2.00c.
3/8 to 1/2 x Nos. 14 and 15.....	2.40c.

## HALF ROUNDS—SOLID

1 to 3 in.....	0.30c.
3/4 to 1 1/8 in.....	0.50c.
3/4 to 1 1/8 in.....	0.70c.
1/2 to 3/8 in.....	1.00c.
3/8 to 1/2 in.....	1.50c.
1/8 in.....	1.75c.

Hollow half rounds are subject to special prices.

## AUTOMOBILE SPRING STEEL

### Flats

1 1/4 to 6 x No. 4 to 1/2 in. incl.....	Base
1 and 1 1/8 x No. 4 and heavier.....	0.10c.
1 to 3 x No. 5.....	0.15c.
1 to 3 x No. 6.....	0.20c.
1 to 3 x No. 7.....	0.25c.
3/4 and 1 1/8 x No. 1 to No. 7.....	0.25c.
3/4 to 1 1/8 x No. 1 to No. 7.....	0.50c.
3/4 to 3 x No. 8 to No. 10.....	0.50c.
3/4 to 3 x No. 11 to No. 16.....	0.75c.
3/4 to 3 x No. 17 to No. 20.....	1.10c.
3/4 to 3/8 x No. 10 to No. 16.....	2.00c.
3/4 to 3/8 x No. 17 to No. 20.....	2.50c.
3/4 to 3/8 x No. 21 to No. 24.....	3.00c.

### Rounds and Squares

3/8 to 2 in. incl.....	Base
1/2 to 3/8 in. incl.....	0.10c.
3/8 to 1/2 in. incl.....	0.25c.
1/8 in.....	0.50c.
1/4 to 3/32 in.....	0.75c.

## AUTOMOBILE BUMPER STEEL BARS

Front or impact bars (including special sections) 0.15c. per pound extra for section and quality, plus extras for chemical specification. Other bumper bars subject to automobile spring steel extras, plus extras for chemical specification.

Railroad spring steel bars take the regular bar extras, including extras for chemical specifications, size, cutting and quantity.

On silicon manganese spring steel, an extra of 0.65c. for quality and chemical specifications applies on flats, while rounds and squares take 0.90c. Automobile spring steel size extras apply, plus bar extras for cutting and quantity. For any quality requirements other than chemistry and Brinell hardness limits, an extra of 0.50c. a lb. applies.

Tube rounds take 0.25c. a lb. extra for quality, plus bar card extras for chemical specifications and the following size extras:

Under 4 1/2 in.....	Base
4 1/2 to 4 3/8 in.....	0.125c.
4 3/8 to 5 1/8 in.....	0.175c.
5 1/8 to 5 3/8 in.....	0.225c.
5 3/8 to 6 1/8 in.....	0.275c.
6 1/8 to 6 3/8 in.....	0.325c.
6 3/8 to 7 1/2 in.....	0.375c.
7 1/8 to 7 3/4 in.....	0.425c.
7 3/4 to 8 in.....	0.550c.

Tube round steel is to be guaranteed against rejections over 3 per cent, based on "heat lots."

When special sections are required, prices including roll costs, etc., will be quoted by individual companies upon application.

## CUTTING EXTRAS

Cutting to specified lengths, other than by machine, takes no extra on lengths 60 in. and over. On lengths over 48 in., up to, but not including 60 in., the extra is 0.10c. a lb.; on 24 to 48 in. inclusive, 0.15c.; on 12 to 24 in. inclusive, 0.30c., and on 12 in. and under, not less than 0.40c. For machine cutting to specified

lengths of rounds and squares 1 1/2 in. and larger, lengths over 48 in. take a 0.20c. extra; lengths 24 to 48 in. inclusive, 0.30c.; lengths 12 to 24 in., 0.40c., and under 12 in., not less than 0.70c. These extras apply on material up to 0.50 carbon and under with steel of a higher carbon content being subject to special consideration. Machine cutting extras on rounds and squares under 1 1/2 in., flats, etc., will be specially considered by individual companies.

## Extras for Machine Straightening of Bars

### ROUNDS

3/8 to 1/2 in. inclusive.....	0.20c.
Over 1/2 to 1 in. inclusive.....	0.20c.
Over 1 to 1 1/2 in. inclusive.....	0.15c.
Over 1 1/2 to 2 in. inclusive.....	0.10c.
Over 2 in.....	No Extra

### SQUARES

3/8 to 1/2 in. inclusive.....	0.20c.
Over 1/2 to 1 in. inclusive.....	0.20c.
Over 1 to 1 1/2 in. inclusive.....	0.15c.
Over 1 1/2 to 2 in. inclusive.....	0.10c.
Over 2 in.....	0.10c.

### HEXAGONS

Up to 1 in. inclusive.....	0.30c.
Over 1 to 1 1/2 in. inclusive.....	0.30c.
Over 1 1/2 to 2 in. inclusive.....	0.20c.
Over 2 in.....	0.20c.

### FLATS

Lighter than 1/4 lb. per ft.....	0.30c.
1/4 lb. per ft. and heavier, up to 1/2 lb. inclusive.....	0.25c.
Over 1/2 lb. per ft. and heavier, up to 3/4 lb. inclusive.....	0.20c.
Over 3/4 lb. per ft. and heavier, up to 2 lb. inclusive.....	0.15c.
Over 2 lb. per ft.....	0.10c.

## Quality Classification

Commercial quality bars are defined as hot rolled carbon steel bars suitable for general commercial purposes and produced in accordance with good mill practice. Standard chemical ranges may be specified, subject to ladle analysis only. Bars shall be free from defects which would be injurious for general or ordinary purposes. If subjected to special processing, such as forging, cold working or heat treating, this shall be done at user's risk. Commercial quality bars take no extra.

Forging quality bars are defined as hot rolled carbon steel bars of specified composition, in the manufacture of which special precautions are taken to produce material suitable for forging, heat treating, or similar purposes in which uniformity of composition and freedom from injurious defects are essential. Standard chemical ranges shall be specified subject to ladle and check analyses. Check analyses shall be subject to Manufacturers' Standard Permissible Variations, Procedure II. The purchaser shall inform the manufacturer as to the kind of work and type of forging for which the steel is required. Bars shall be rolled from billets with special discards or equivalent precautions against piping or excessive segregations and prepared by selection, chipping, or other methods looking to the elimination of seams and surface defects of such extent as would become injurious in the fabricated part for which the material is required. The extra for forging quality is 0.25c. a lb., as compared with 0.15c., heretofore.

Special requirement quality bars are defined as hot rolled carbon steel bars subject to special restrictions as agreed upon between manufacturer and consumer, such as the amount of discard, extra restrictive requirements on check analysis, metallographic examinations, guaranteed results on heat treatments, etc. This classification corresponds to a class heretofore designated as Guaranteed Forging Steel, and takes an extra of 0.50c. a lb.

## Extras for Chemical Specifications on Bessemer and Open-Hearth Bars and Small Shapes

### CARBON

(The mean of the range agreed upon between purchaser and manufacturer to determine the extra.)

Open-hearth 0.10 to 0.25 }.....	No Extra
Bessemer 0.08 to 0.25 }.....	
Open-hearth and Bessemer 0.26 to 0.60.....	0.05c.
Open-hearth and Bessemer 0.61 to 1.25.....	0.15c.

When maximum specified is:

Open-hearth 0.09 }.....	0.05c.
Bessemer 0.07 }.....	



## MANGANESE

(The mean of the range agreed upon between purchaser and manufacturer to determine the extra.)

0.30 to 0.90	No Extra
0.91 to 1.15	0.10c.
1.16 to 1.35	0.20c.
1.36 to 1.50	0.25c.
1.51 to 2.00 (No extra for forging quality)	0.65c.

NOTE: When the mean of the range agreed upon is above 1.15, the extras shall apply only to steel with maximum carbon specified 0.20 or higher, and shall not apply to structural shapes or plates. Prices for these exceptions to be quoted on application.

## SILICON

(The mean of the range agreed upon between purchaser and manufacturer shall determine the extra.)

Minimum not specified	No Extra
Up to 0.25 inclusive	0.10c.
0.26 to 0.50 inclusive	0.20c.

NOTE: Above silicon extras do not apply to structural shapes or plates.

## PHOSPHORUS

Minimum not specified	No Extra
Up to 0.08 minimum inclusive	0.05c.

NOTE: Phosphorus extra applies to open-hearth steel only.

## SULPHUR

Minimum not specified	No Extra
Up to 0.10 minimum inclusive	0.10c.
0.11 to 0.20 minimum inclusive	0.175c.
0.21 to 0.30 minimum inclusive	0.25c.

## COPPER

Minimum not specified	No Extra
Up to 0.20 minimum	0.10c.

NOTE: Extra for higher copper content to be quoted on application.

## Special Extras

Annealing or normalizing	1.00c.
Pipe or box annealing	1.50c.
Heat treating	1.50c.
Special carburizing steel	0.50c.
Pickling	0.15c.
Oiling	0.10c.
Pickling and liming	0.25c.
Pickling and oiling	0.25c.

NOTES: Extras are applicable only to acceptable sizes in the chemical limits specified.

When material is ordered to physical requirements the extras for the required chemical contents shall apply.

## Quantity Differentials

"Lump sum" quantity extras will apply to all orders for less than 6000 lb. of a size to cover cost of handling and assembling. These extras are to be added to the net price of the material and are to be determined by the total weight of a size ordered, for shipment at one time. Quantities less than 6000 lb. but not less than 4000 lb. take a "lump sum" extra of \$2; less than 4000 lb. but not less than 2000 lb., \$4; less than 2000 lb. but not less than 1000 lb., \$5, and less than 1000 lb., \$12. In the Birmingham district, per lb. quantity differentials apply, lots of less than 2000 lb. but not less than 1000 lb. taking 0.25c. a lb., and less than 1000 lb., 50c. a lb.

## United States Navy Specifications on Bars and Small Shapes

(Extras for Specification and Inspection)

Specification	Commodity	Grade	Extra
43-B-11A	Bolts, nuts and bars for same	Class "A" (Alloy)	Alloy
		Class "B"	0.10c. a lb.
		Class "C" (no test)	0.10c. a lb.
		C.P. Nut	0.10c. a lb.
43-R-1c	Rivet rods and rivets for hull construction	Medium	0.10c. a lb.
46-S1f	Shapes and bars for hull construction	High tensile (Alloy)	Alloy
		Common	Base
		Soft and medium	0.10c. a lb.
46-S-2c	For Reforging	High tensile (Alloy)	Alloy
46-S-4c	Carbon steel bars for reforging	Extra soft bar steel	0.10c. a lb.
43-S-19	Boiler staybolt steel		1.00c. a lb.
			0.35c. a lb.

Charges for other than mill inspection, such as "Lloyd's," or "American Bureau of Shipping," for buyer's account.

## Structural Shapes

Structural shapes are quoted at 1.60c. a lb., base Pittsburgh, 1.70c. a lb., base Buffalo, 1.65c. base Chicago, 1.75c. base Birmingham, 1.70c. base Bethlehem, 2c. base Gulf ports (f.o.b. cars on dock), 2.15c. base Pacific Coast ports (f.o.b. cars on dock). Subject to all extras per classification of extras on structural shapes.

## ANGLES, STRUCTURAL SIZES, STANDARD GAGES

3 in. to 6 in. on one or both legs	Base
Over 6 in. on one or both legs	0.10c.

## SPECIAL GAGE ANGLES

6 x 6 x $\frac{3}{8}$ in.	0.10c.
5 x 5 x $\frac{3}{8}$ in.	0.10c.
4 x 4 x $\frac{3}{8}$ in.	0.30c.
3½ x 3½ x $\frac{3}{8}$ in.	0.30c.
3 x 3 x $\frac{3}{8}$ in.	0.35c.
3 x 3 x $\frac{1}{2}$ in.	0.50c.
6 x 4 x $\frac{3}{8}$ in.	0.10c.
6 x 3½ x $\frac{3}{8}$ in.	0.10c.
5 x 3½ x $\frac{1}{4}$ in.	0.15c.
5 x 3 x $\frac{1}{4}$ in.	0.15c.
4 x 3½ x $\frac{1}{4}$ in.	0.25c.
4 x 3½ x $\frac{3}{8}$ in.	0.30c.
4 x 3 x $\frac{3}{8}$ in.	0.30c.
3½ x 3 x $\frac{3}{8}$ in.	0.30c.
3½ x 2½ x $\frac{3}{8}$ in.	0.30c.
3½ x 2 x $\frac{3}{8}$ in.	0.35c.
3 x 2½ x $\frac{3}{8}$ in.	0.35c.
3 x 2 x $\frac{3}{8}$ in.	0.35c.

## Length Extras

Under 5 ft. to 3 ft. incl.	0.10c.
Under 3 ft. to 2 ft. incl.	0.25c.
Under 2 ft. to 1 ft. incl.	0.50c.
Under 1 ft.	1.55c.
Over 80 ft. to 90 ft. incl.	0.10c.
Over 90 ft. to 100 ft. incl.	0.15c.
Over 100 ft.	0.15c. plus 0.05c. for every additional 5 ft. or fraction thereof.

NOTE: In any case, cutting to lengths under 5 ft. subject to prior arrangement.

Lengths over 80 ft. applicable only to those sizes which can be furnished to these over-lengths.

## Quality Extras

Conforming to latest issue of ASTM specifications covering structural steel for either bridges or buildings or else manufacturer's standard or equivalent	Base
Hull material subject to U. S. Navy specifications for medium or soft steel	0.10c.
High tensile hull steel subject to U. S. Navy or equivalent specifications	1.00c.
Silicon steel subject to ASTM specifications A94-27 or equivalent and Hi-Ten steel:	
Standard structural shapes	0.60c.
Wide flange sections	0.75c.
Copper 0.20 per cent minimum	0.10c.

## INSPECTION

Mill's inspection No Extra

Charges for other than mill inspection, such as "Lloyd's" or "American Bureau of Shipping," are for buyer's account and will be made by the inspection bureau direct to buyer.

## Concrete Reinforcing Bars

Plain or deformed new billet steel concrete reinforcing bars in stock lengths are quoted at 1.80c. a lb., Pittsburgh; 1.85c., Chicago, Gary, Cleveland, Youngstown, Buffalo or Birmingham; 2.20c., f.o.b. cars on dock at Gulf ports, and 2.35c., f.o.b. cars on dock at Pacific Coast ports. They are subject to standard extras for size and cutting to length, as defined in extra lists but apply only on standard sizes listed in the usual extra cards. A reduction of 0.20c. a lb. under the above base prices may be made to recognized fabricators, distributors or jobbers of reinforcing bars, who are able to qualify as such under the steel code in accordance with requirements approved by the directors of the American Iron and Steel Institute.

Rail steel reinforcing bars are quoted at the same basing points as new billet steel material at prices 0.05c. a lb. or \$1 a ton under new billet bar quotations. They are subject to the same size extras, but extras for cutting to length do not apply to rail steel material. All  $\frac{3}{8}$  to  $\frac{1}{4}$ -in. rail steel bars, stirrups, column ties and truss bars continuous over more than two supports are subject to a bending extra of 0.80c. a lb., while truss bars for beams and slabs, radius bending and types not described above take a bending extra of 0.30c. a lb. As in the case of new billet steel bars, the base prices on rail steel material are subject to a reduction of 0.20c. a lb. to fabricators, distributors and jobbers, who are also given a reduction of 0.05c. a lb. under the bending extras.

### Standard Sizes of Concrete Reinforcing Bars

(Rolled from new billet steel to conform with Manufacturers' Standard Specifications or others mutually acceptable.)

	Area in Sq. In.	Est. Weight Per Ft. in Lb.
* $\frac{1}{8}$ in. Round .....	0.049	0.167
$\frac{3}{16}$ in. Round .....	0.110	0.376
$\frac{1}{2}$ in. Round .....	0.196	0.668
$\frac{5}{8}$ in. Square .....	0.250	0.850
$\frac{3}{4}$ in. Round .....	0.307	1.043
$\frac{7}{8}$ in. Round .....	0.442	1.502
1 in. Round .....	0.601	2.044
1 in. Square .....	0.785	2.670
1 in. Square .....	1.000	3.400
1 $\frac{1}{4}$ in. Square .....	1.266	4.003
1 $\frac{1}{2}$ in. Square .....	1.563	5.313

\*Furnished in plain round.

### Classification and Extras for Concrete Reinforcing Bars

SECTION	Per lb. extra
$\frac{3}{4}$ to 1 $\frac{1}{4}$ in. ....	Base
$\frac{5}{8}$ in. ....	0.10c.
$\frac{1}{2}$ in. ....	0.20c.
$\frac{3}{8}$ in. ....	0.40c.
$\frac{1}{4}$ in. plain round .....	1.00c.

### CUTTING TO SPECIFIED LENGTHS

Cutting to lengths of 60 in. and over, except as noted below .....	0.10c.
Cutting to lengths over 48 in. to, but not including, 60 in. ....	0.10c.
Cutting to lengths over 24 in. to 48 in., inclusive .....	0.15c.
Cutting to lengths over 12 in. to 24 in., inclusive .....	0.30c.
Cutting to lengths of 12 in. and under, not be less than ..	0.40c.

NOTE: Extra for cutting to lengths 60 in. and over will not be assessed under the following conditions:

(1) Provided shipment of shorts not exceeding 10 per cent of the total quantity ordered is permitted:

(2) Provided leeway in length is permitted as follows:  
Lengths 5 ft. to 30 ft., inclusive.....2 ft. leeway  
Lengths over 30 ft. to 40 ft., inclusive.....3 ft. leeway  
Lengths over 40 ft. ....5 ft. leeway

## Plates

Plates are quoted at 1.60c. a lb., base Pittsburgh; 1.65c. a lb., base Chicago; 1.65c., base Gary; 1.75c., base Birmingham; 1.70c., base Coatesville, Pa.; 1.70c., base Sparrows Point, Md.; 2c., base Gulf ports (f.o.b. cars on dock); 2.15c., base Pacific Coast ports (f.o.b. cars on dock). Subject to all extras per standard classification of extras on steel plates.

### GENERAL CONDITIONS

Plates are described as follows:

Over 6 in. wide to 48 in. incl. in width—0.250 (10.2 lb.) and thicker.

Over 48 in.—0.1875 (7.65 lb.) and thicker.

Rectangular plates, of tank steel or Manufacturers' Standard structural steel, or equivalent; over 6 in. to 100 in. inclusive, in width;  $\frac{1}{4}$  in. to 2 in. inclusive in thickness, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered  $\frac{1}{4}$ -in. plates. Plates over 72 in. wide must be ordered  $\frac{1}{4}$  in. thick on edge, or not less than 11 lb. per sq. ft., to take base price.

Plates over 72 in. wide, ordered less than 11 lb. per sq. ft. down to the weight of 3/16 in., take the price of 3/16-in. plates and all extras for width of 3/16-in. plates as well as gage extras.

Allowable overweight for rectangular plates, whether ordered to gage or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

All sketches, including circles, are invoiced at actual weight and are not subject to weight tolerances applying to rectangular plates.

Any charges for inspection, such as "Lloyd's," "American Bureau of Shipping," or any other "Inspection Bureaus," to be a matter of arrangement between the buyer and the inspection company and for buyer's account.

Each extra listed herein is a separate and distinct extra and does not, unless otherwise noted, include or absorb any other extra listed. Full extra applying over base price is the total of all extras applicable to specified requirements of the order.

### Gage Extras

Gages lighter than $\frac{1}{4}$ in. and including 3/16 in. on thin edge over 48 in. wide to 72 in. wide, inclusive.....	0.20c.
Plates over 72 in. wide ordered 7.65 lb.....	0.30c.
Plates over 2 in. thick, subject to physical test requirements—Over 2 in. thick, up to and including 4 in.....	0.50c.
Over 4 in. thick .....	0.75c.

### Width or Diameter Extras

All Plates, Rectangular or Otherwise

(Applies to plates  $\frac{1}{4}$  in. thick and heavier but not less than 11 lb. per sq. ft. if ordered to weight.)

Widths over 100 in. to 110 in., incl.....	0.05c.
Widths over 110 in. to 115 in., incl.....	0.10c.
Widths over 115 in. to 120 in., incl.....	0.15c.
Widths over 120 in. to 125 in., incl.....	0.25c.
Widths over 125 in. to 130 in., incl.....	0.50c.
Widths over 130 in. to 140 in., incl.....	0.75c.
Widths over 140 in. to 155 in., incl.....	1.00c.

### Width Extras for Wide Light Plates

All Plates, Rectangular or Otherwise

(Applies to Plates less than  $\frac{1}{4}$  in. gage or lighter than 11 lb. per sq. ft.)

Widths over 72 in. to 84 in., incl.....	0.10c.
Widths over 84 in. to 96 in., incl.....	0.20c.
Widths over 96 in. to 100 in., incl.....	0.30c.
Widths over 100 in. to 110 in., incl.....	0.40c.
Widths over 110 in. to 115 in., incl.....	0.45c.

Gage and cutting extras, where applicable, are in addition to extras for widths or diameters.

### Cutting Extras

Length or Diameter

All Plates, Rectangular or Otherwise

3 ft. and over up to published limit of length, but not over 80 ft. ....	No Extra
Under 3 ft. to 2 ft. ....	0.25c.
Under 2 ft. to 1 ft. ....	0.50c.
Under 1 ft. ....	1.55c.
Over 80 ft. to and including 90 ft.....	0.10c.
Over 90 ft. to and including 100 ft.....	0.15c.
Over 100 ft., 0.15c. plus 0.05c. for every additional 5 ft. or fraction thereof.	

### REGULAR SKETCHES

With Not More Than Four Straight Edges  
(Including straight taper plates)

Additional extra .....	0.20c.
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### IRREGULAR SKETCHES

With More Than Four Straight Edges  
(Sketches cannot be sheared with reentrant angles)

Additional extra .....	0.50c.
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### Quality Extras

Copper steel (copper 0.20 per cent minimum).....	0.10c.
Pressing steel (not flange steel for boilers).....	0.10c.
Flange steel, boiler quality .....	0.15c.
Ordinary firebox steel .....	0.20c.
Stillbottom steel .....	0.30c.
Locomotive firebox steel .....	0.50c.
Structural silicon steel, A.S.T.M. A-94 .....	0.75c.

### SPECIAL REQUIREMENTS

Specified amount of discard, not to exceed 50 per cent, total .....	0.40c.
Segregation tests (other than check analysis and homogeneity tests covered in A.S.T.M. and A.S.M.E. standard specifications) involving check analysis or fracture tests from top of plate.....	0.25c.
Tension tests from top of plate, i.e., other than at the side according to standard practice under A.S.T.M. or A.S.M.E. specifications .....	0.25c.
Etch tests .....	0.25c.
When physical tests are specified beyond those called for in A.S.T.M. specifications of a similar grade and other than provided on this card for each additional test..	0.10c.

### Extras for Specified Carbon

Carbon 0.10 to 0.25 .....	No extra
Carbon 0.25 to 0.40 .....	0.10c.
Carbon 0.41 to 0.60 .....	0.25c.

The mean of the range shall determine the extra. The range shall be not less than 10 points.

### NORMALIZING

Normalizing for relieving or adjusting rolling or cutting stresses .....	0.50c.
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### PICKLING, OILING AND ANNEALING

PLATES—6-1/16 in. wide to 23-15/16 in. wide inclusive, 1/4 in. to 3/4 in. incl. in thickness	
Pickling .....	0.25c.
Annealing .....	0.15c.
PLATES—24 in. wide to 48 in. wide inclusive, 1/4 in. to 3/4 in. incl. in thickness	
Over 48 in. wide to 65 in. wide inclusive, 3/16 in. to 1/2 in. incl. in thickness	
Pickling .....	0.15c.
Oiling .....	0.10c.
Annealing .....	0.15c.

## What Is a Jobber?—The Official Definition

THE following regulations are prescribed by the board of directors of American Iron and Steel Institute under section 4 of schedule E of the code of fair competition of the iron and steel industry, dated Aug. 17, 1933, with reference to deductions from the price of any product that may be allowed to jobbers:

1. Wherever used in these regulations, unless the context shall otherwise clearly indicate, the terms which are defined in article I of said code and in section 1 of schedule E thereof shall have the respective meanings therein set forth.

2. For the purposes of section 4 of schedule E of the code and of these regulations, any person, firm, association or corporation shall be deemed to be a jobber in respect of any product or products, as the term "products" is defined in the code, if

(a) he is (or in good faith is about to become) engaged in the business of purchasing such product or products for resale and of selling it or them in the United States without processing or fabricating it or them;

(b) he regularly owns and maintains in the United States a sufficient stock of such product or products to enable him to meet ordinary demands upon him for such product or products and as a rule purchases it or them in car-load lots;

(c) at least 75 per cent of his annual sales of such product or products have been and are (or will be) made to one or more of the following named classes of purchasers: retail dealers, manufacturers who use annually substantial quantities of such product or products, contractors, public service corporations, oil producing and/or refining corporations, gas producing corporations, pipe line corporations and mining corporations; and

(d) he employs traveling salesmen who regularly call upon and solicit orders from one or more of the classes of purchasers named in the foregoing clause (c).

For the purpose of these regulations, the terms "processing" and "fabricating" as used herein shall not include cutting to length or size, bending or, in the case of pipe, threading or coupling.

3. Pursuant to the provisions of section 4 of schedule E of the code, before any member thereof shall allow any deduction from the price of any product to any jobber as permitted by the provisions of said section, such member shall secure from such jobber an agreement substantially in the appropriate one of the three forms of agreement prescribed and designated as schedules 1, 2 and 3, respectively. Any such agreement may cover one or more products, and every such agreement shall state therein the product or products covered thereby.

4. Each member of the code shall prepare and mail, postage prepaid, to the secretary, for filing in his office, lists showing the respective names and addresses of the jobbers with whom it shall have made agreements as required by the provisions of the foregoing paragraph 3, and the kinds of products covered by them, respectively, as follows:

(a) on or before Oct. 5, 1933, a list showing the names and addresses of the jobbers with whom such member of the code, prior to Oct. 1, 1933, made such agreements, and the kinds of products covered by them, respectively;

(b) on or before the fifth day of each month beginning with the month of November, 1933, a

list showing the names and addresses of the jobbers with whom such member of the code made such agreements during the preceding calendar month, and the kinds of products covered by them, respectively; and

(c) on or before Jan. 20, 1934, and thereafter on or before the twentieth day of July and January in each year, a revised list showing the names and addresses of all the jobbers with whom, prior to the first day of July or January, as the case may be, such member of the code had made such agreements that were then in effect, and the kinds of products covered by them, respectively.

5. Any jobber who shall violate any such agreement shall, for all purposes of the code and of these regulations, thereupon cease to be a jobber, unless and until reinstated as such by order of the board of directors.

6. Notwithstanding the fact that any person, firm, association or corporation in any such agreement shall have made representation that such person, firm, association or corporation is a jobber within the meaning of the term "jobber" as it is defined in these regulations, nevertheless the member of the code which shall have made such agreement shall make reasonable inquiry for the purpose of determining that such representation was correct, and thereafter from time to time such member shall make like inquiry for the purpose of determining whether such person, firm, association or corporation is at the time a jobber within the meaning of that term as aforesaid.

Prescribed by the board of directors Aug. 29, 1933.

## Alloy and Special Steels

Alloy steel bars are quoted at 2.45c. a lb., base, Pittsburgh, Buffalo, Chicago, Canton and Massillon, Ohio, and 2.55c., Bethlehem. Alloy ingots, blooms, billets and slabs are priced at \$51.00 a ton, Bethlehem, and \$49.00, all other basing points.

### Extras for Alloy and Electric Furnace Quality

Grade S.A.E.	Open-Hearth Alloy Differentials		Alloy and Electric Furnace Quality Differentials	
	Bars, 100 Lb. Gross Ton	Billets, 100 Lb. Gross Ton	Bars, 100 Lb. Gross Ton	Billets, 100 Lb. Gross Ton
2000 .....	\$0.25	\$5.00	\$0.75	\$15.00
2100 .....	.55	11.00	1.05	21.00
2300 .....	1.50	30.00	2.00	40.00
2500 .....	2.25	45.00	2.75	55.00
3100 .....	.55	11.00	1.05	21.00
3100—nickel 1.25/1.75....	.65	13.00	1.15	23.00
3200 .....	1.35	27.00	1.85	37.00
3400 .....	3.20	64.00	3.70	74.00
3300 .....	3.80	76.00	4.30	86.00
4100—0.15/0.25 moly....	.50	10.00	1.00	20.00
4100—0.25/0.40 moly....	.70	14.00	1.20	24.00
4600—0.20/0.30 moly....				
1.50/2.00 nickel..	1.05	21.00	1.30	26.00
5100—Under 0.60 chrome..	.25	5.00	.60	12.00
5100—0.60/0.90 chrome..	.35	7.00	.70	14.00
5100—0.80/1.10 chrome..	.45	9.00	.80	16.00
5100—Spring flats.....	Base	Base	....	....
*6100—Bars .....	1.20	24.00	1.70	34.00
*6100—Spring flats.....	.70	14.00	....	....
*Nickel-chrome-vanadium..	1.50	30.00	2.00	40.00
*Carbon vanadium.....	.95	19.00	1.45	29.00
*Silico vanadium — Sil.				
0.50/0.70—Van. 15 Min.	1.60	32.00	2.10	42.00
Chrome nickel moly.—Cr.				
0.50/1.00 Ni 1.50/2.25				
Moly. 0.15/0.25.....	2.30	46.00	2.80	56.00
Chrome nickel moly.—Cr.				
0.50/1.00 Ni 1.50/2.25				
Moly. 0.25/0.40.....	2.50	50.00	3.00	60.00
3½ per cent nickel moly.				
Moly. 0.15/0.30.....	2.00	40.00	2.40	48.00
2½ per cent nickel-mang.				
—R. R. analysis.....	1.10	22.00	1.60	32.00
2 per cent nickel 1 per cent				
sil. bars.....	2.10	42.00	2.60	52.00
2 per cent nickel 1 per cent				
sil. springs.....	1.85	37.00	2.35	47.00
Mang.-moly.-mg. 1.40/1.70				
—Mo. 0.15/0.25.....	.40	8.00	.90	18.00
Mang.-moly.-mg. 1.60/1.90				
—Mo. 0.15/0.30.....	.50	10.00	1.00	20.00
Carbon moly.—Mo. 0.10/-				
0.20 .....	.20	4.00	.70	14.00
Carbon moly.—Mo. 0.15/-				
0.25 .....	.25	5.00	.75	15.00
2 per cent nickel iron—				
1.75/2.25 Nickel.....	2.05	41.00	2.55	51.00
Cr. 0.65/0.85 sil. 0.40/0.60				
mang. 0.70/0.90—Flats.	.60	12.00	1.10	22.00
Cr. 0.65/0.85 sil. 0.40/0.60				
mang. 0.70/0.90 rds.				
and sqs.....	.85	17.00	1.35	27.00
52100 .....	2.80	56.00	3.30	66.00
*Vanadium 0.18 Min.....	10c. per 100 lb. increase			
Vanadium 0.10 Min.....	10c. per 100 lb. reduction			
Vanadium 0.05/0.10 Min.	20c. per 100 lb. reduction			
Vanadium 0.01/0.05.....	35c. per 100 lb. reduction			

NOTE: Above the 0.15-0.25 molybdenum range add \$0.05 per 100 lb. for each additional five points of molybdenum. The minimum of the range is to govern.

Extra for high sulphur. High manganese in accordance with carbon bar card of extras.

### Size Extras

#### ROUNDS AND SQUARES, AND GOTHIC SECTIONS

3/4 to 3 1/16 in. ....	Base
5/8 to 1 1/16 in. ....	0.10c.
9/16 in. ....	0.15c.
1/2 in. ....	0.20c.
7/16 in. ....	0.30c.

3/8 in. ....	0.40c.
11/32 in. ....	0.55c.
5/16 in. ....	0.70c.
9/32 in. ....	0.85c.
1/4 in. ....	1.00c.
15/64 in. ....	1.25c.
7/32 in. ....	1.50c.
3/16 in. ....	2.00c.
3 1/8 to 3 9/16 in. ....	0.10c.
3 5/8 to 4 1/16 in. ....	0.15c.
4 1/8 to 4 9/16 in. ....	0.25c.
4 5/8 to 5 1/16 in. ....	0.35c.
5 1/8 to 5 9/16 in. ....	0.45c.
5 5/8 to 6 1/16 in. ....	0.55c.
6 1/8 to 6 9/16 in. ....	0.65c.
6 5/8 to 7 1/4 in. ....	0.75c.
7 5/16 to 7 3/4 in. ....	0.85c.
7 13/16 to 8 in. ....	1.10c.

### HEXAGONS

3 9/16 to 4 1/8 in. ....	1.25c.
3 1/8 to 3 1/2 in. ....	1.10c.
1 5/8 to 3 1/16 in. ....	0.25c.
3/4 to 1 9/16 in. ....	0.125c.
5/8 to 1 1/16 in. ....	0.20c.
1/2 to 9/16 in. ....	0.35c.
7/16 in. ....	0.60c.
3/8 in. ....	0.90c.
5/16 in. ....	1.20c.
1/4 in. ....	1.50c.

### OCTAGONS

3/4 to 3 1/16 in. ....	0.25c.
5/8 to 1 1/16 in. ....	0.40c.
1/2 to 9/16 in. ....	0.60c.
7/16 in. ....	0.80c.
3/8 in. ....	1.00c.
5/16 in. ....	1.20c.
1/4 in. ....	1.50c.

### FLATS

Width in Inches	Thickness							
	4 to 31/16	3 to 21/16	2 to 11/16	1 to 13/16	3/4 to 1/2	7/16 to 3/8	5/16 to 1/4	
3/8 .....	...	...	...	...	...	...	...	1.40
7/16 .....	...	...	...	...	...	...	...	1.00 1.20
1/2 .....	...	...	...	...	...	...	...	0.70 0.90
9/16 .....	...	...	...	...	...	0.50	0.50	0.75
5/8 to 1 1/16 .....	...	...	...	...	...	0.40	0.40	0.60
3/4 to 1 3/16 .....	...	...	...	...	...	0.30	0.30	0.40
7/8 to 1 5/16 .....	...	...	...	...	0.20	0.20	0.20	0.30
1 to 1 3/8 .....	...	...	0.10	Base	Base	Base	Base	0.15
1 7/16 to 2 .....	...	...	0.10	Base	Base	Base	Base	0.15
2 1/16 to 2 1/2 .....	...	0.20	0.10	Base	Base	Base	Base	0.15
2 9/16 to 3 .....	...	0.20	0.10	Base	Base	Base	Base	0.15
3 1/16 to 3 1/2 .....	0.30	0.20	0.10	Base	Base	Base	Base	0.15
3 9/16 to 4 .....	0.30	0.20	0.10	Base	Base	Base	Base	0.15
4 1/16 to 5 .....	0.30	0.20	0.10	Base	Base	Base	Base	0.15
5 1/16 to 12 .....	0.30	0.20	0.10	Base	Base	Base	Base	0.15

### BANDS

Width in Inches	Thickness (Bands)									
	Under 1/4 In. to 3/16 In.	No. 7	No. 8	No. 9	No. 10	1/8	No. 11	No. 12		
3/8 .....	1.60	1.60	1.60	1.60	1.70	1.70	1.70	1.80		
7/16 .....	1.30	1.30	1.30	1.30	1.40	1.40	1.40	1.50		
1/2 .....	1.10	1.10	1.10	1.10	1.15	1.15	1.15	1.25		
9/16 .....	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.05		
5/8 to 1 1/16 .....	0.80	0.80	0.80	0.80	0.85	0.85	0.85	0.90		
3/4 to 1 3/16 .....	0.65	0.65	0.65	0.65	0.70	0.70	0.70	0.75		
7/8 to 1 5/16 .....	0.55	0.55	0.55	0.55	0.60	0.60	0.60	0.65		
1 to 1 3/8 .....	0.50	0.50	0.50	0.50	0.55	0.55	0.55	0.60		
1 7/16 to 2 .....	0.45	0.45	0.45	0.45	0.50	0.50	0.50	0.55		
2 1/16 to 2 1/2 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
2 9/16 to 3 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
3 1/16 to 3 1/2 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
3 9/16 to 4 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
4 1/16 to 5 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
5 1/16 to 6 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
6 1/16 to 8 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
8 1/16 to 10 .....	0.40	0.40	0.40	0.40	0.45	0.45	0.45	0.50		
10 1/16 to 12 1/2 .....	0.45	0.45	0.45	0.45	0.50	0.50	0.50	0.60		
12 9/16 to 15 .....	0.50	0.50	0.50	0.50	0.60	0.60	0.60	0.70		
15 1/16 to 24 .....	0.55	0.55	0.55	0.55	0.70	0.70	0.70	0.80		



# Spring Steels—Size Extras

## ROUND AND SQUARE

¾ to 2 in., inclusive.....	Base
¾ to 9/16 in., inclusive.....	0.10c.
¾ to 7/16 in., inclusive.....	0.25c.
5/16 in. ....	0.50c.
¼ and 9/32 in. ....	0.75c.

## FLAT

1½ to 6 in. x No. 4 to ½ in., inclusive.....	Base
1 and 1½ in. x No. 1 to No. 4, inclusive.....	0.10c.
1 to 3 in. x No. 5.....	0.15c.
1 to 3 in. x No. 6.....	0.20c.
1 to 3 in. x No. 7.....	0.25c.
¾ and 15/16 in. x No. 1 to No. 7.....	0.25c.
¾ to 11/16 in. x No. 1 to No. 7.....	0.50c.
¾ to 3 in. x No. 8 to No. 10.....	0.50c.
¾ to 3 in. x No. 11 to No. 16.....	0.75c.
¾ to 3 in. x No. 17 to No. 20.....	1.10c.
¾ to ¾ in. x No. 10 to No. 16.....	2.00c.
¾ to ¾ in. x No. 17 to No. 20.....	2.50c.
¾ to ¾ in. x No. 21 to No. 24.....	3.00c.

## BLOOMS, BILLETS AND SLABS

4 in. x 4 in. to under 10 in. x 10 in. or equivalent area....	Base
	Per G. T.
10 in. x 10 in. to under 14 in. x 14 in. or equivalent area..	\$12.00
14 in. x 14 in. to under 16 in. x 16 in. or equivalent area..	14.00
16 in. x 16 in. to under 20 in. x 20 in. or equivalent area..	16.00
20 in. x 20 in. to under 24 in. x 24 in. or equivalent area..	25.00
24 in. x 24 in. to under 30 in. x 30 in. or equivalent area..	35.00
When weight per piece ordered is 12,000 lb. or over (In addition to above size extras).....	10.00
(This extra shall not apply when product of ingot is accepted)	

NOTE: All sections under 4 x 4 in. or equivalent area will be sold only on bar basis. Slabs 16 sq. in. cross sectional area and 2½ in. thick or over will be sold on billet basis.  
Under above dimensions as bars.

## Extras for Machine Cutting to Specified Lengths

### BLOOMS, BILLETS AND SLABS

	Per G. T.
Over 4 ft. ....	\$4.00
Over 2 ft. to 4 ft., inclusive.....	6.00
Over 1 ft. to 2 ft., inclusive.....	8.00
1 ft. and less, extra will be furnished on application, but will not be less than.....	14.00

# ROUNDS, SQUARES, HEXAGONS, OCTAGONS AND FLATS

## ½ IN. AND LARGER

	Hot	
	Sawing and	Machine
	Hot Shearing	Cutting
45 ft. and over.....	\$1.50	\$1.60
40 ft. to under 45 ft.....	1.00	1.10
35 ft. to under 40 ft.....	.50	.60
30 ft. to under 35 ft.....	.20	.30
25 ft. to under 30 ft.....	.15	.25
Over 4 ft. to under 25 ft.....	.10	.20
Over 2 ft. to 4 ft. inclusive.....	.15	.30
Over 1 ft. to 2 ft. inclusive.....	.30	.40

1 ft. and less—Extra will be furnished on application but will not be less than... .40 .70  
Provided random lengths or 10 per cent shorts or multiples of not over 5 ft. are acceptable, extras for hot sawing or hot shearing lengths 5 ft. and over will not apply.

Random lengths which are acceptable follow:

5 ft. to 30 ft. acceptable with a 2 ft. leeway  
30 ft. to 40 ft. acceptable with a 3 ft. leeway  
40 ft. to 50 ft. acceptable with a 5 ft. leeway

## Extras for Cracker Cutting to Specified Lengths

5 ft. to under 25 ft.....	.10
Over 4 ft. to, but not including 5 ft.....	.15
Over 2 ft. to 4 ft. inclusive.....	.225
Over 1 ft. to 2 ft. inclusive.....	.35
1 ft. and under on application.	
25 ft. and over on application.	

The above extras apply only to 0.40 per cent "mean" carbon and under where machine cutting or cracker cutting are involved.

Extras for machine-cutting over 0.40 per cent carbon will be furnished on application.

Extras for cutting sizes under ½ in. will be furnished on application.

## Extras for Straightening

Machine straightening rounds 1½ in. and larger.....	0.10c.
Machine straightening rounds under 1½ in.....	0.20c.
Machine straightening squares, hexagons and octagons, 1½ in. and larger.....	0.20c.
Machine straightening squares, hexagons and octagons under 1½ in. ....	0.30c.
Machine straightening flats 2 x ½ in. and larger.....	0.20c.
Machine straightening flats under 2 x ½ in.....	0.50c.

## Cold Shearing Extra Cost

Type	SAE	As	0.05/0.15	0.10/0.20	0.15/0.25	0.20/0.30	0.25/0.35	0.30/0.40	0.35/0.45	0.40/0.50	0.45/0.50	0.50/0.60
of Steel	Series	Above	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Nickel	2000	HR	4½	4½	...	...	...	...	...	...	...	...
		SR	4½	4½	...	...	...	...	...	...	...	...
	2100	HR	4½	4½	...	...	...	...	...	...	...	...
		SR	4½	4½	...	...	...	...	...	...	...	...
	2300	RR	4	3	2¾	2½	2	1¾	1½	1¼	1¼	...
		SR	4	4	4	4	4	3¾	3½	3¼	3¼	...
Nickel	2500	HR	3	3	2½	...	...	...	...	...	...	...
		SR	4	4	4	...	...	...	...	...	...	...
	3100	HR	3½	3½	3½	3	2¾	2¼	2	1¾	1½	...
		SR	4	4	4	4	4	4	4	4	4	...
	3200	HR	3	3	2½	2¼	2	1¾	1½	...	...	...
		SR	4	4	4	4	4	4	3¾	3½	3¼	...
Chromium	4100	HR	3½	3½	3½	2¾	2½	2¼	2	...	...	...
		SR	4	4	4	4	4	4	4	3¾	3¾	...
	4600	HR	3	3	3	2½	...	...	...	...	...	...
		SR	4	4	4	4	...	...	...	...	...	...
	5100	HR	3	3	2½	2¼	2	1¾	1½	1¾	1¼	...
		SR	4	4	4	4	4	4	3¾	3 7/16	3¼	...
Chromium	6100	HR	3	3	2½	2¼	2	1¾	1½	1¾	1¼	...
		SR	4	4	4	4	4	4	3¾	3 7/16	3¼	...
	Vanadium	HR	3	3	2½	2¼	2	1¾	1½	...	...	...
		SR	4	4	4	4	4	4	3¾	3 7/16	3¼	...
	Chromium Nickel..	HR	3	3	2½	2¼	2	1¾	1½	...	...	...
		SR	4	4	4	4	4	4	3¾	3¼	3¼	...
Molybdenum	3½ per cent Nickel	HR	3	3	2½	...	...	...	...	...	...	...
		SR	4	4	4	...	...	...	...	...	...	...

### Special Extras

Annealing or normalizing.....	\$0.75
Pipe or box annealing.....	1.50
Does not include machine straightening.	
For machine straightening, see machine straightening extras.	
Heat treating.....	\$1.50
Double treatment when annealing and normalizing are both specified or spheridise anneal.....	1.50
If any of the above are specified there will be no extra charge for machine straightening.	
Pickling.....	\$0.15
Oiling.....	.10
Pickling and Liming.....	.25
Pickling and Oiling.....	.25

### BAND SIZES

Pickling and Oiling or Liming	
Widths under 1½ in. ....	\$0.55
Widths 1½ in. and over.....	.40

### COLD SHEARING

Guaranteed Cold Shearing Within Hot Rolled Limitations is Base

	Per 100 Lb.
Guaranteed cold shearing above hot rolled limitations, but not over stress relief limitation.....	25c.
Above stress relief limitation without cold shearing guarantee to consumer, material can be ordered pit annealed.....	25c.
See Cold Shearing Chart.	

### EXTRA FOR USE OF EXTENSOMETER FOR ELASTIC LIMIT DETERMINATION

Where the use of extensometer for elastic limit determination is specified.....	25c. per 100 lb.
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### McQUAID EHN TEST

The A.S.T.M. Chart will be standard. Not less than three photos in sequence in the accepted range, irrespective of analysis.

### ETCH TEST

Billets, blooms and slabs under 10 x 10 in. or equivalent cross section area.....	\$5.00 per G. T.
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### DECARBURIZATION OF HOT ROLLED—UNANNEALED PRODUCTS

1 in. and under	Max.	0.012 in. on a side
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### QUANTITY EXTRAS

Lump sum extras to apply to individual items of a size and grade ordered at one time for delivery at one time.

	Symbol
Less than 6,000 lb. and down to 4,000 lb....	\$2.00 A
Less than 4,000 lb. and down to 2,000 lb....	4.00 B
Less than 2,000 lb. and down to 1,000 lb....	8.00 C
Under 1,000 lb.....	12.00 D

### ROLLING TOLERANCE

Extras published in this card are based on furnishing material to alloy standard tolerances.

### NOTE

This card gives a complete list of standard extras on alloy steels, but is not an indication of sizes companies are prepared to furnish. For intermediate sizes, the next higher extra to be charged in all cases. The gage of bands and spring steels is to be interpreted as Birmingham wire gage.

### DEFINITION OF BARS

Bars are defined as all sizes under 4 x 4 in.  
Billets for rerolling purposes take established billet prices.

### Stainless Steel Bars, Plates, Sheets and Strip

#### Base Prices, Cents per Pound

(Extras, as listed below this base price table, to be added for special composition, finish, size, etc.)

	Nos. 1 and 2		Hot Rolled Only		Finish		Strip	
	Bars	Plates	Sheets	H.R.	C.R.			
Max. 0.08% C, 18% Cr, 8% Ni.....	24c.	28c.	35c.	24½c.	32c.			
Over 0.08 to 0.12% C, 19% Cr, 9% Ni....	24c.	28c.	35c.	24½c.	32c.			
Over 0.08% to 0.20% C, 18% Cr, 8% Ni	23c.	26c.	33c.	23½c.	30c.			
Over 0.08% to 0.20% C, 18% Cr, 8% Ni,								

2% to 4% Mo.....	38c.	41c.	45c.	38c.	45c.
18% Cr, 8% Ni, plus Ti equal to 4 times C content.....	27c.	32c.	39c.	27½c.	36c.

### FREE MACHINING QUALITY

Over 0.08% to 0.20% C, 18% Cr, 8% Ni, S and or Se Min. 0.15%.....	25c.	28c.	35c.	25½c.	32c.
Over 0.08% to 0.20% C, 20% Cr, 10% Ni	26c.	30c.	37c.	26½c.	34c.
25% Cr, 20% Ni....	48c.	51c.	52c.	48c.	55c.
8% Cr, 22% Ni, 1.00 to 1.50% Cu.....	25c.	29c.	36c.	25½c.	33c.
18% Cr, 25% Ni....	48c.	51c.	52c.	48c.	55c.
Carbon Max. 0.20% 25% Cr, 12% Ni..	35c.	39c.	46c.	35½c.	46c.
C Max. 0.12%, Cr 12% to 15%, S and or Se Min. 0.15%....	17c.	20c.	25c.	17c.	22½c.

### TURBINE QUALITY

C Max. 0.12%, Cr 11½ to 13%.....	20c.	23c.	28c.	20c.	25½c.
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### STAINLESS GRADE A

C over 0.12%, Cr 12 to 15%.....	28c.	31c.	36c.	28c.	37c.
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### STAINLESS GRADE B

C over 0.12%, Cr over 15 to 18%.....	26c.	29c.	34c.	26c.	35c.
Cr over 18 to 23%..	21c.	24c.	31c.	21c.	27c.

### STAINLESS GRADE C1

C Max. 0.12%, Cr 12 to 15%.....	17c.	20c.	25c.	17c.	22½c.
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### STAINLESS GRADE C2

C Max. 0.12%, Cr over 15 to 18%.....	18½c.	21½c.	28c.	18½c.	24c.
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### STAINLESS GRADE C4

C Max. 0.25%, Cr 23 to 30%.....	26c.	29c.	35c.	26c.	35c.
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### 4 TO 6 PER CENT CHROME

0.25 to 0.21% C.....	6½c.	9½c.	13½c.	9½c.	13½c.
0.20 to 0.16% C.....	7½c.	10½c.	14½c.	10½c.	14½c.
0.15 to 0.11% C.....	8½c.	11½c.	15½c.	11½c.	15½c.
0.10% Max. C.....	9c.	12c.	16c.	12c.	16c.

### DIFFERENTIALS FOR QUANTITY

(Do not apply to tubing or to 4 to 6 per cent Chrome)

Over 40,000 Base	
Under 40,000 to 20,000 lb.....	add 1c.
Under 20,000 to 10,000 lb.....	add 1½c.
Under 10,000 to 5,000 lb.....	add 2c.
Under 5,000 to 2,000 lb.....	add 3c.
Under 2,000 to 1,000 lb.....	add 4c.
Under 1,000 to 500 lb.....	add 5c.
Under 500 to 300 lb.....	add 7c.
Under 300 to 200 lb.....	add 9c.
Under 200 to 100 lb.....	add 11c.
Under 100 lb.....	add 12c.

(Following quantity differentials apply to 4 to 6 per cent Chrome)

Over 40,000 Base	
Under 40,000 to 20,000 lb.....	add ¼c.
Under 20,000 to 10,000 lb.....	add ½c.
Under 10,000 to 5,000 lb.....	add 1c.
Under 5,000 to 2,000 lb.....	add 1½c.
Under 2,000 to 1,000 lb.....	add 2c.
Under 1,000 to 500 lb.....	add 2½c.
Under 500 to 300 lb.....	add 3½c.
Under 300 to 200 lb.....	add 4½c.
Under 200 to 100 lb.....	add 5½c.
Under 100 lb.....	add 6c.

Above quantity differentials are applicable only to individual items of a size and gage ordered at one time for shipment at one time.

### EXTRAS FOR ALLOY ADDITIONS

0.40 to 0.60% Mo.....	Add 1c. per lb.
0.75 to 1.25% Ti.....	Add 3c. per lb.
1.00 to 2.00% Si.....	Add 1c. per lb.



## EXTRAS FOR SIZE, SHAPE, ETC.

Billets, round or round-cornered square, for forging 4 in. and larger, and round-cornered flat at 16 sq. in. cross sectional area and larger, 10% less than the bar base.

Billets smaller than 4 in. round or square, and flats of less than 16 sq. in. cross-sectional area, take the finished bar classification.

Billets, annealed for cold cutting or cold shearing, take an extra 1c. per pound; if rough turned add 1½c. per lb. One-half of stainless quantity extras also apply.

When cold cut to exact length, add regular extras for wastage.

## SEAMLESS TUBE BILLETS

Round billets 3 in. and larger, for piercing, for the manufacture of seamless tubes, hot-rolled bar base less 10%. With no extra for size. When rough turned add 1½c. per pound, cutting to length or weight ¼c. per pound. One-half of stainless quantity extras also apply.

# Code Terms on Pipe Assure Definite Profit to Jobbers

Code terms for the sale of merchant pipe will protect the jobbers against themselves. Out-of-stock minimum resale prices will be fixed by the mills and will represent the sum of the Pittsburgh (or other basing point) flat card, the carload freight rate and a fixed allowance for the jobbers' profit. Jobbers are required to qualify as jobbers and to sign agreements with mills. One of the stipulations agreed to is that no pipe will be sold at less than the minimum resale price established under the code. Heretofore, in certain large centers of distribution, competition among jobbers frequently wiped out the margin above the prices at which pipe was bought from the producers.

## Steel Pipe

The basing points for standard commercial quality steel pipe, line pipe, and large O.D. pipe are Pittsburgh, Lorain, Ohio, and Gary, Ind.

Basing point discounts are to be used that produce the lowest delivered prices. All quotations and prices shall be made delivered destination by using published all-rail rates of freight.

Prices for tubular products provide for furnishing material to Standard Commercial Practice and American Petroleum Institute specifications or its equivalent. Other than these specifications must be submitted for approval, and prices will be quoted only on application.

Prices are for standard threads and couplings and other standard finishes and sizes for the various classes, kinds and grades of tubular products. For finishes and sizes other than those regularly established for the various classes, kinds and grades of tubular products, prices will be quoted only on application.

No grade or kind of tubular products, including untested, seconds or short lengths, will be sold at less than schedule prices for standard commercial quality steel tubular products.

Carload prices apply only on straight carload lots for one buyer of tubular products only and shipped as such. Less-than-carload prices apply on less-than-carload shipments of tubular products and not consolidated in cars with other kinds of steel products.

Prices to manufacturers of steel pipe for shipment in carloads or less-than-carloads to their manufacturing plants for resale in connection with their own tubular products are subject to customary 5 per cent discount beyond that allowed to the trade for carload quantities.

Where the word jobber is used, this means wholesalers, jobbers and distributors established for the distribution of tubular products. Jobbers, or any agency, when authorized to make direct sales for the mill's account will be allowed a commission for the service rendered, but no part of this commission may be passed on to the buyer.

Consigned accounts with other than established jobbers of tubular products are to be terminated on or before June 30, 1934, and all stocks held on consignment on that date shall either be sold to the consignee or possession thereof shall be taken by the consignor. Consigned accounts of standard pipe, to the regular established pipe jobbing trade only, will be continued until further notice.

## Terms to Jobbers for Material Ordered for Resale from Stock

### MAXIMUM RATES OF DISCOUNT FOR EARLY PAYMENT

Maximum 60 days net, or 2 per cent cash discount allowed if the invoice is paid on or before the 15th day of the month following month of shipment, applied to basing point value of material.

### MAXIMUM PERIOD OF FREE CREDIT

Sixty days.

## Terms to Jobbers for Direct Shipment Sales, and to Consumers and All Other Classes of Trade

### Maximum Rate of Discount for Early Payment

In the case of products shipped from plants located east of the Mississippi River to Pacific Coast ports and which shall be invoiced from such plants—one-half of 1 per cent, if the invoice of such products shall be paid within 25 days from the date of invoice; in all other cases—one-half of 1 per cent, if the invoice of such products shall be paid within 10 days from the date of such invoice; provided, however, in the latter cases, that any member of the code may allow such discount of one-half of 1 per cent for payment within 10 days on the basis of settlements three times in each month, as follows:

(1) On invoices for products dated from the 1st to the 10th, inclusive, in any month, such discount may be allowed on payment of such invoices on or before the 20th of such month;

## Prices for Cut Length Pipe in Points Discount for Cutting Plain Ends, Also Cutting and Threading Standard Full Weight, Extra Strong and Double Extra Strong Steel Pipe

SIZES AND CLASSES	LENGTHS					
	2 ft. 6 in. to 4 ft. 11½ in.	5 ft. 0 in. to 7 ft. 11½ in.	8 ft. 0 in. to 10 ft. 11½ in.	11 ft. 0 in. to 15 ft. 11½ in.	16 ft. 0 in. to 22 ft. 0 in.	
Standard Pipe	Cutting	Cutting	Cutting	Cutting	Cutting	
Reamed and Drifted Pipe	Cutting and Threading	Cutting and Threading	Cutting and Threading	Cutting and Threading	Cutting and Threading	
Butt Weld						
¾ in., ¾ in., ¾ in. ....	12½	7½	5	5	2½	4
½ in. to 3 in. ....	7½	4½	3	3	1½	2½
Lap Weld						
¾ in. to 12 in. ....	7½	4½	3	3	1½	2½
Extra Strong Pipe						
Double Extra Strong Pipe						
Butt Weld						
¾ in., ¾ in., ¾ in. ....	12½	7½	5	5	2½	7
½ in. to 3 in. ....	7½	4½	3	3	1½	5½
Lap Weld						
¾ in. to 12 in. ....	7½	4½	3	3	1½	5½

\* Note—Applies only to such sizes as are listed as standard and to such lengths as can be furnished

(2) On invoices for products dated from the 11th to the 20th, inclusive, in any month, such discount may be allowed on payment of such invoices on or before the 30th of such month; and

(3) On invoices for products dated from the 21st to the end of any month, such discount may be allowed on payment of such invoices on or before the 10th of the next following month.

Any discount allowed in accordance with the provisions of this schedule shall apply only to the invoiced value of the products specified therein and not to any part of the transportation charges on such products.

#### MAXIMUM PERIODS OF FREE CREDIT

In the case of products shipped from plants located east of the Mississippi River to Pacific Coast ports, which shall be invoiced from such plants—45 days; in all other cases—30 days.

#### Interest and Carrying Charges for All Classes of Trade

Specific projects on which terms of payment beyond above mentioned free credit time are required, and subject to manufacturer's approval and acceptance, shall carry an annual interest rate of 6 per cent for the additional time up to but not beyond six months from date of invoice, and for any period beyond six months, and not over one year from date of invoice, shall carry in addition to the 6 per cent annual interest rate, a carrying charge of not less than one-fourth of 1 per cent per month, and for any period beyond one year from date of invoice, shall carry in addition to the 6 per cent annual interest rate, a carrying charge of not less than one-half of 1 per cent per month.

#### Sales Regulations—Extras and Allowances Standard Steel Pipe and Large O.D. Pipe

Basing discounts are quoted for standard pipe and reamed and drifted pipe with threads and couplings. Prices for threads only are one point higher discount (lower price). Prices for plain ends, butt weld and lap weld, sizes 3-in. and smaller, are two points higher discount (lower price), and lap weld, sizes 3½-in. and larger, are three points higher discount (lower price).

Basing discounts are quoted for extra strong and double extra strong pipe with plain ends. Prices for extra strong and double extra strong pipe threads only are three points lower discount (higher price). Prices for extra strong and double extra strong pipe threads and couplings are five points lower discount (higher price).

Prices to jobbers for carloads are card discounts less 5 per cent and 5 per cent applying to their stock business and not to direct shipments.

Prices to consumers for carloads are card discounts less 5 per cent, and when sold through a jobber 5 per cent may be allowed as extreme commission on the basing point value of the material with the following exceptions—that prices to pipe nipple manufacturers, fire protection sprinkler system manufacturers, power piping fabricators, and ice machine or refrigeration system manufacturers for carloads are card discounts less 5 per cent and 5 per cent applying to their stock business, and when sold to these sources through a jobber 2½ per cent may be allowed as extreme commission on the basing point value of the material.

The sale of standard pipe fitted with line pipe couplings has been discontinued and hereafter this class of material will be priced on the basis of threaded and coupled line pipe.

Minimum out-of-stock selling prices for consigned stock jobbers are as follows:

Flat card discounts as shown on basing cards, revised Aug. 29, 1933, and filed herewith, plus the carload freight from applicable basing point to destination, plus 20 per cent on standard pipe and reamed and drifted pipe both black and galvanized, sizes 6 in. (6% OD) and smaller, plus 25 per cent on all larger sizes of standard pipe, also all sizes extra strong and double extra strong pipe, both black and galvanized, and large O.D. pipe, both black and galvanized.

It is suggested that where exchange prices between jobbers are made, these prices be not lower than 10 per cent less than the above minimum out of stock prices for consigned stock jobbers.

When less-carload shipments are made to a jobber's stock, 10 per cent reduction from the above less-carload prices may be allowed, provided, however, that in no case shall the delivered price be less than the base price for carloads plus the less-carload freight from applicable basing point to destination.

When less-carload shipments are made from mill to others than jobbers' stocks, they shall be priced on the basis of the minimum out-of-stock price authorized above for consigned jobbers, provided, however, that in no case shall the delivered price be less than the base price for carloads plus the less-carload freight from applicable basing point to destination.

Contracts for specific projects may be made at prevailing prices either directly with contractors or builders, or through jobbers subject to the approval of the mill.

Contracts with consumers such as public utilities, oil and gas companies, manufacturing concerns, railroads, etc., may be made at prevailing prices, either directly with the consumer or through jobbers, provided, however, that no contract of sale shall be made by the terms of which the shipment of such products is not required to be completed before the end of the calendar quarter-year ending not more than four months after the date of the making of such contract.

For standard or reamed and drifted pipe in cut lengths, the points discount shown are to be deducted (higher price) from basing discounts for random lengths, plain ends or random lengths threads only as ordered.

For extra strong pipe or double extra strong pipe in cut lengths, the points differential shown are to be deducted (higher price) from basing discounts applying to random lengths, plain ends.

For all classes of goods shown in lengths shorter than 2 ft. 6 in. that can be finished in regular threading machines, charge the same per 100 pieces for cutting, also cutting and threading as would be charged for a 2 ft. 6 in. length. If couplings are required for cut length specifications or are shipped separately from pipe, an extra charge will be made.

The foregoing extra charges for cutting and for cutting and threading are net to the consumer, and we may allow a 5 per cent preferential to jobbers, applying to either stock or direct shipment business.

#### PIPE FITTED IN RUNS

Standard pipe 12¼ in. O. D. and smaller fitted in runs, for the whole run charge two points lower discount (higher price) applying to plain ends, threads only, or threads and couplings, depending on the class of finish specified.

#### HALF RANDOM LENGTHS

Standard pipe 12¼ in. O. D. and smaller cut in half random lengths, fitted with threads and couplings, charge three points additional (higher price) in base discount.

#### THIRD AND QUARTER LENGTHS

Standard pipe sizes 2 in. and smaller, for ½ lengths (random 5 ft. to 8 ft.) and ¼ lengths (random 3 ft. to 6 ft.) charge five points lower discount (higher price) and seven points lower discount (higher price) respectively, than prices for random lengths fitted with threads and couplings.

Standard pipe sizes 2½ in. and larger, furnished in ¼ lengths (random 5 ft. to 8 ft.) and ¼ lengths (random 3 ft. to 6 ft.) charge as shown in table.

#### Third and Quarter Lengths, Extra Charge for Random Lengths T & C

Pipe Size	Cutting & Threading per Piece	Extra for Coupling per Piece	5 ft. to 8 ft. Pipe per Foot	3 ft. to 6 ft. Pipe per Foot
2½ in.	\$0.29	\$0.19½	\$0.0746	\$0.1077
3 in.	0.38	0.29	0.1030	0.1488
3½ in.	0.46	0.50	0.1476	0.2133
4 in.	0.55	0.65	0.1846	0.2666
4½ in.	0.64	0.70	0.2061	0.2977
5 in.	0.74	0.95	0.2600	0.3755
6 in.	0.96	1.10	0.3169	0.4577
7 in.	1.19	1.40	0.3984	0.5755
8 in.	1.25	1.60	0.4384	0.6333
9 in.	1.60	3.00	0.7076	1.0222
10 in.	1.60	4.25	0.9000	1.3000
11 in.	2.25	5.00	1.1153	1.6111
12 in.	2.25	6.25	1.3076	1.8888

All extra charges shown on this sheet are net to the consumer, and a five per cent preferential may be allowed to jobbers, applying to either stock or direct shipment business.

#### FITTING LARGE O. D. PIPE

An additional charge will be made for cut lengths and for fitting with threads only or threads and couplings.

In compiling table below showing extra per foot charges for finishing random lengths, net prices per foot are based on average lengths of 20 ft.; where cut lengths are ordered, the cost per piece given is to be absorbed according to the class of finish desired.

These extras are based on fitting with line pipe couplings, or drive pipe couplings:



Size O.D.	Thickness	Cutting		Cutting and Threading		Threads and Couplings	
		Plain End	Random Lengths	Random Lengths	Coupling	Random Lengths	Random Lengths
		Per Ft.	Per Ft.	Per Ft.	Each	Per Ft.	Per Ft.
14 in.	1/4 in.	\$0.80	...	...	...	...	...
	5/16 in.	0.85	\$2.30	\$0.1150	\$9.50	\$11.80	\$0.5900
	3/8 in.	0.90	2.35	0.1175	9.50	11.85	0.5925
	7/16 in.	0.95	2.40	0.1200	9.50	11.90	0.5950
	1/2 in.	1.00	2.45	0.1225	9.50	11.95	0.5975
15 in.	9/16 in.	1.05	2.50	0.1250	9.50	12.00	0.6000
	1/4 in.	0.90	...	...	...	...	...
	5/16 in.	0.95	2.80	0.1400	11.25	14.05	0.7025
	3/8 in.	1.00	2.85	0.1425	11.25	14.10	0.7050
	7/16 in.	1.05	2.90	0.1450	11.25	14.15	0.7075
16 in.	1/2 in.	1.10	2.95	0.1475	11.25	14.20	0.7100
	9/16 in.	1.15	3.00	0.1500	11.25	14.25	0.7125
	1/4 in.	1.00	...	...	...	...	...
	5/16 in.	1.05	3.10	0.1550	12.25	15.35	0.7675
	3/8 in.	1.10	3.15	0.1575	12.25	15.40	0.7700
	7/16 in.	1.15	3.20	0.1600	12.25	15.45	0.7725
	1/2 in.	1.20	3.25	0.1625	12.25	15.50	0.7750
	9/16 in.	1.25	3.30	0.1650	12.25	15.55	0.7775

For special lengths within limits shown in following schedule, add charges listed below to the random plain end per foot price for material, adding regular extras for finishing as given above.

Sizes	Lengths	Extra Charges
14 in. to 16 in. O.D.	20 ft. 1/4 in. to 22 ft. 6 in.	10%
14 in. to 16 in. O.D.	22 ft. 1/4 in. to 24 ft. 1 in.	15%

For cut lengths that cannot be manufactured except at a loss in production, i. e., lengths between 10 ft. 1/2 in. and 16 ft., there will be an additional charge.

If the specification is such that lengths can be combined and cut from long lengths the percentage given in above schedule for long material will be added to the per foot price for random plain end pipe; to which sum will be added the regular charge for finishing as given above.

14 in. to 16 in. O. D. pipe in lengths 10 ft. 1/4 in. to 11 ft. 3 in., carry additional charge of 10 per cent.

14 in. to 16 in. O. D. pipe in lengths 11 ft. 3 1/4 in. to 12 ft., carry additional charge of 15 per cent.

14 in. to 16 in. O. D. pipe in lengths 12 ft. 1/4 in. to 15 ft. 1 1/4 in. will be priced on the basis of full 16 ft. lengths and the surplus short material after cutting the required length will be disposed of as instructed on the order either by shipping to customer or retained by the manufacturer and applied to scrap, and allowance made at current market price for scrap.

The foregoing extra charges for fitting large O. D. pipe and for special lengths large O. D. pipe are net to the consumer, and a five percent preferential may be allowed to jobbers, applying to either stock or direct shipment business.

#### CONDUIT PIPE

Prices on pipe to conduit manufacturers for the production of rigid conduit pipe shall be card basing discounts for threaded and coupled pipe with the following allowances:

Double conduit lengths approximately 20 ft., plain ends—

Butt weld—5 points more basing discount (lower price)

Lap weld—3 points more basing discount (lower price)

Single conduit lengths approximately 10 ft., plain ends—

Butt weld—4 points more basing discount (lower price)

Lap weld—2 points more basing discount (lower price)

Single conduit lengths approximately 10 ft., threads only—

Lap weld—1 point more basing discount (lower price)

The basing discounts arrived at as above described are subject to preferential allowances of five and five per cent.

DRY KILN PIPE FITTED WITH SPECIAL DRY KILN COUPLINGS, RANDOM LENGTHS OR EXACT LENGTHS BETWEEN 17 AND 22 FT.

Prices are the same as for random length standard pipe with threads and couplings.

#### DRIVE WELL PIPE

This pipe is furnished in 1 1/4 in., 1 1/2 in. and 2 in. sizes and in random lengths 3 to 6 ft. and 6 to 10 ft., threads and couplings.

Prices are the same as for standard pipe in random lengths fitted with threads and couplings, plus the following extras:

##### Higher Price

6 ft. to 10 ft. random lengths.....	5 points lower discount
3 ft. to 6 ft. random lengths.....	5 points lower discount
5 ft. exact lengths.....	5 points lower discount
4 ft. exact lengths.....	8 points lower discount
3 ft. exact lengths.....	12 points lower discount
2 ft. exact lengths.....	15 points lower discount

#### WELL PIPE

Sizes 1 in. and 1 1/4 in. galvanized in exact 18-ft. lengths fitted with standard threads and couplings.

Prices are the same as for random length standard galvanized pipe fitted with threads and couplings when sold for well purposes only in the Central West.

#### AMMONIA-ICE MACHINE PIPE

Sizes 3 In. and Smaller

Prices are the same as for standard black pipe and when so specified on order each length will be air-tested without additional charge.

#### PLAIN END PIPE FOR THE MANUFACTURE OF WHEELBARROWS

In Exact 8-ft. Lengths or Longer

Prices are the same as for random length plain end standard black pipe.

#### PLAIN-END PIPE FOR FABRICATION INTO TUBULAR STEEL POLES

In Exact Lengths 5 Ft. or Longer

Prices are the same as for random-length plain end standard pipe and extra strong pipe.

#### GALVANIZING NET EXTRA CHARGE

Prices for galvanizing other classes of tubular goods not shown on basing cards are \$22 a net ton for sizes 7 in. O.D. and smaller and \$24 a net ton for sizes 7 1/4 in. O.D. to 16 in. O.D.

#### Sales Regulations—Extras and Allowances Line Pipe Threaded and Coupled

Lap weld O.D. line pipe, sizes 14 in. O.D. to 16 in. O.D. are priced from large O.D. plain-end pipe card with extras for threads and couplings.

Prices to jobbers for carloads are card discounts less 5 per cent and 5 per cent, applying to their stock business, and not to direct shipments.

Prices to consumers for carloads are card discounts less 5 per cent, and when sold through a jobber we may allow 5 per cent as extreme commission on the basing point value of material.

Prices for galvanized line pipe in sizes and weights as shown for black line pipe on recent basing card, revised Aug. 29, 1933, are the same points discount spread as between black and galvanized standard pipe as shown on recent basing card, revised Aug. 29, 1933. For all classes of trade the same preferentials apply to galvanized line pipe as shown above for black line pipe.

The above prices apply to all butt and lap-weld line pipe, except for a "large" lot of lap-weld line pipe as described below, for a specific project.

The prices for a "large" lot of lap-weld line pipe are card discounts less 5 per cent and 10 per cent, and when sold through a jobber 3 per cent may be allowed as extreme commission on the basing point value of material.

The prices quoted for a "large" lot of line pipe are for the purpose of economical rolling of large tonnages, and therefore will not apply to any class of specification that does not permit such rolling, nor will it apply to jobbers' stocks or blanket orders.

The following quantities, subject to a 10 per cent variation under, describe a "large" lot of lap-weld line pipe, as referred to above:

2 1/2 in. O.D. to 5 9/16 in. O.D.....	500 tons
6 in. O.D. to 7 1/2 in. O.D.....	1000 tons
8 in. O.D. to 9 1/2 in. O.D.....	1500 tons
10 in. O.D. to 12 1/4 in. O.D.....	2000 tons
13 in. O.D. to 16 in. O.D.....	2500 tons

For inquiries embracing several sizes, the total quantity will regulate the price basis as follows:

If the percentages of the required amounts of each size total 100, the "large" lot prices apply.

##### EXAMPLE NO. 1

200 tons 2 1/2 in. O.D. to 5 9/16 in. O.D. equal 40% of	500
600 tons 6 1/2 in. O.D. to 7 1/2 in. O.D. equal 60% of	1000

tot'l 800 tons

100%

"Large" lot prices apply.

##### EXAMPLE NO. 2

100 tons 2 1/2 in. O.D. to 5 9/16 in. O.D. equal 20% of	500
333 tons 6 1/2 in. O.D. to 7 1/2 in. O.D. equal 33 1/3% of	1000
500 tons 8 1/2 in. O.D. equal 33 1/3% of	1500

tot'l 933 tons

86 2/3%

"Large" lot prices do not apply.

**Sales Regulations—Extras and Allowances Lap-Weld  
Plain-End Line Pipe**

The following basing points discounts apply to Standard Commercial Practice and American Petroleum Institute lap-weld plain-end line pipe with ends beveled for welding, or with ends made smooth for Dresser or Dayton-type of couplings.

Items marked thus \* list prices are to be established on the basis theoretical weight figured at 10c. per pound, dropping all figures beyond cents column; thus, 4½ in. O.D. 5.976 lb. takes list price 59c. per ft. and 4½ in. O.D. 11.347 ft. takes list price \$1.13 per ft.

F.O.B.						
		PITTSBURGH		F.O.B.		
		OR LORAIN		GARY		
O.D. Size	Thickness	Single Lengths	Double Lengths	Single Lengths	Double Lengths	List Price  Ft.
		Per Cent	Per Cent	Per Cent	Per Cent	
2½ in.	0.153 in. and lighter	62	61	60	59	*
	All other weights, not including standard and extra strong pipe .....	65	64	63	62	*
	0.154 in. standard weight .....	65½	64½	63½	62½	\$0.37
	0.218 in. extra strong .....	61½	60½	59½	58½	\$0.50½
2⅞ in.	0.165 in. and lighter	65	64	63	62	*
	All other weights, not including standard and extra strong pipe .....	68	67	66	65	*
	0.203 in. standard weight .....	68½	67½	66½	65½	\$0.58½
	0.276 in. extra strong .....	65½	64½	63½	62½	\$0.77
3½ in.	0.165 in. and lighter	65	64	63	62	*
	All other weights, not including standard and extra strong pipe .....	68	67	66	65	*
	0.216 in. standard weight .....	68½	67½	66½	65½	\$0.76½
	0.300 in. extra strong .....	65½	64½	63½	62½	\$1.03
4 in.	0.165 in. and lighter..	68	67	66	65	*
	All other weights, not including standard and extra strong pipe .....	71	70	69	68	*
	0.226 in. standard weight .....	71½	70½	69½	68½	\$0.92
	0.318 in. extra strong .....	69	68	67	66	\$1.25
4½ in.	0.165 in. and lighter	68	67	66	65	*
	0.166 in. and .205 in.	70	69	68	67	*
	All other weights, not including standard and extra strong pipe .....	71	70	69	68	*
	0.237 in. standard weight .....	71½	70½	69½	68½	\$1.09
	0.337 in. extra strong .....	69	68	67	66	\$1.50
4¾ in.	Prices are same discounts as for corresponding thick- nesses from 10c. per pound list as specified below for 5 in. O.D.					
5 in.	0.165 in. and lighter.....	68	67	66	65	*
	0.166 in. to .205 in.....	70	69	68	67	*
	All other weights, not in- cluding standard and extra strong pipe.....	71	70	69	68	*
	0.247 in. standard weight.....	71½	70½	69½	68½	\$1.27
	0.355 in. extra strong....	69	68	67	66	1.80
5¼ in.	Prices are same discounts as for corresponding thick- and nesses from 10c. per pound list as specified be'ow for 5½ in. 5¾ in. O.D.					

O. D. Size	Thickness	F.O.B.				List Price
		PITTSBURGH OR LORAIN		F.O.B. GARY		
		Single Lengths Per Cent	Double Lengths Per Cent	Single Lengths Per Cent	Double Lengths Per Cent	
5 1/8 in.	0.188 in. and lighter.....	68	67	66	65	*
	0.189 in. to 0.220 in.....	70	69	68	67	*
	All other weights, not in- cluding standard and extra strong pipe.....	71	70	69	68	*
	0.258 in. standard weight..	71 1/2	70 1/2	69 1/2	68 1/2	\$1.48
	0.375 in. extra strong...	69	68	67	66	2.08
6 in.	Prices are same discounts as for corresponding thick- nesses from 10c. per pound list as specified below for 6 1/2 in. O.D.					
6 3/8 in.	0.203 in. and lighter.....	68	67	66	65	*
	0.204 in. to 0.245 in.....	70	69	68	67	*
	All other weights, not in- cluding standard and extra strong pipe.....	71	70	69	68	*
	0.280 in. standard weight..	71 1/2	70 1/2	69 1/2	68 1/2	\$1.92
	0.432 in. extra strong....	69	68	67	66	2.86
7 in.-7 7/8	Prices are same discounts as for corresponding thick- in. and nesses from 10c. per pound list as specified below for 8 1/2 in. O.D.					
8 in.	0.220 in. and lighter.....	67	66	65	64	*
	0.221 in. to 0.276 in.....	69	68	67	66	*
	All other weights, not in- cluding two standard weights and extra strong pipe .....	70	69	68	67	*
	0.277 in. standard weight..	70 1/2	69 1/2	68 1/2	67 1/2	\$2.50
	0.322 in. standard weight..	70 1/2	69 1/2	68 1/2	67 1/2	2.88
	0.500 in. extra strong....	68	67	66	65	4.34
9 in.-9 5/8	Prices are same discounts as for corresponding thick- in. and nesses from 10c. per pound list as specified below for 10 in. 10 3/4 in. O.D.					
10 3/4 in.	0.250 in. and lighter....	66 1/2	65 1/2	64 1/2	63 1/2	*
	0.251 in. to 0.278 in....	68 1/2	67 1/2	66 1/2	65 1/2	*
	All other weights, other than three standard weights and extra strong pipe .....	69 1/2	68 1/2	67 1/2	66 1/2	*
	0.279 in. stand. weight..	70	69	68	67	\$3.20
	0.307 in. stand. weight..	70	69	68	67	3.50
	0.365 in. stand. weight...	70	69	68	67	4.12
	0.500 in. extra strong..	67	66	65	64	5.48
11 in.-11 3/4	Prices are same discounts as for corresponding thick- in. and nesses from 10c. per pound list as specified below for 12 in. 12 3/4 in. O.D.					
12 3/4 in.	0.250 in. and lighter....	65 1/2	64 1/2	63 1/2	62 1/2	*
	0.251 in. to 0.307 in....	67 1/2	66 1/2	65 1/2	64 1/2	*
	All other weights, other than two standard weights and extra strong pipe .....	68 1/2	67 1/2	66 1/2	65 1/2	*
	0.330 in. stand. weight..	69	68	67	66	\$4.50
	0.375 in. stand. weight..	69	68	67	66	5.07
	0.500 in. extra strong..	66	65	64	63	6.55
14 in.	Lighter than 1/8 in....	64	63	62	61	*
	1/8 in. and heavier.....	65 1/2	64 1/2	63 1/2	62 1/2	*
15 in. & 16 in.	Lighter than 1/8 in....	63	62	61	60	*
	1/8 in. and heavier.....	64 1/2	63 1/2	62 1/2	61 1/2	*

Prices to jobbers for carloads are card discounts less 5 per cent and 5 per cent, applying to their stock business, and not to direct shipments.

Prices to consumers for carloads are card discounts less 5 per cent, and when sold through a jobber 5 per cent may be allowed as extreme commission on the basing point value of material.

The following prices are to apply to all plain end lap-weld line pipe except for a "large" lot as described below for a specific project. The prices for a "large" lot are card discounts less 5 per cent and 10 per cent, and when sold through a jobber, 3 per cent may be allowed as extreme commission on the basing point value of the material.



Prices quoted for a "large" lot of line pipe are for the purpose of economical rolling of large tonnages, and therefore will not apply to any class of specification that does not permit such rolling, nor will it apply to any jobbers' stocks or blanket orders.

The following quantities, subject to a 10 per cent variation under, describe a "large" lot of lap weld plain end line pipe, as referred to above:

2 3/8 in.	O. D. to 5 1/8 in.	O. D.	500 tons
6 in.	O. D. to 7 5/8 in.	O. D.	1000 tons
8 in.	O. D. to 9 5/8 in.	O. D.	1500 tons
10 in.	O. D. to 12 3/4 in.	O. D.	2000 tons
13 in.	O. D. to 16 in.	O. D.	2500 tons

For inquiries embracing several sizes, the total quantity will regulate the price basis as follows: If the percentages of the required amounts of each size total 100, the "large" lot prices apply.

#### Schedule for "Priming Coat"

The following net extras cover priming of pipe with Biturine and Biturine Inhiburine manufactured by the General Paint Corp. or Hill-Hubbell Co., and Bitumastic manufactured by the Walles-Dove-Hermiston Corp. The extras shown in first column for Biturine or Bitumastic primer will likewise apply for any other standard primer. Should customer elect to ship sufficient priming coat to coat the pipe to be supplied on any particular order f. o. b. works, any coating so furnished will be supplied free of charge.

		Biturine and Bitumastic primer extras per 100 ft. net	Biturine Inhiburine primer extras per 100 ft. net
2 3/8 in.	O. D. and smaller	\$ .35	\$ .37
3 1/2 in.	O. D.	.50	.53
4 1/2 in.	O. D.	.60	.63
6 5/8 in.	O. D.	.80	.84
8 5/8 in.	O. D.	1.00	1.05
10 3/4 in.	O. D.	1.20	1.26
12 3/4 in.	O. D.	1.40	1.47
14 in.	O. D.	1.55	1.63
16 in.	O. D.	1.70	1.79

When sold for direct shipment through jobbers the same commission will be allowed as is applicable to the class of pipe coated.

#### Schedule for "Grooving Plain End Pipe" for Victaulic Couplings

For "grooving plain end pipe" for victaulic couplings, prices are net extra per 100 ft. of pipe as shown in table below.

		Welded per 100 ft.	
		20 ft. Average Single Lgths.	40 ft. Average Double Lgths.
2 3/8 in.	O. D.	\$ .18	\$ .09
2 3/8 in.	O. D.	.29	.14
3 1/2 in.	O. D.	.38	.19
4 in.	O. D.	.46	.23
4 1/2 in.	O. D.	.54	.27
5 1/8 in.	O. D.	.74	.37
6 5/8 in.	O. D.	.96	.48
8 5/8 in.	O. D.	1.44	.72
10 3/4 in.	O. D.	2.06	1.03
12 3/4 in.	O. D.	2.53	1.26
14 in.	O. D.	2.73	1.36
15 in.	O. D.	2.93	1.46
16 in.	O. D.	3.13	1.56

When sold for direct shipment through jobbers the same commission will be allowed as is applicable to the class of pipe grooved.

#### Price Schedule for Chill Rings

For chill rings such as manufactured by Wedge Protectors, Inc., Cleveland, for either the "electric type" or the "construction type" ring, prices are as given below.

Size	List Price per Ring
6 5/8 in.	\$ .35
8 5/8 in.	.37 1/2
10 3/4 in.	.39
12 3/4 in.	.40
14 in.	.44
16 in.	.47

f. o. b. cars Cleveland.

The above list is net on all orders for lots less than 100, but for larger quantities the following discounts will apply: Electric type: To consumers in lots of 100 or more prices are 25 per cent off above list prices. To jobbers in lots of 100 or more prices are 25 per cent and 5 per cent off above list prices; Construction type: To consumers in lots of 100 or more prices are 25 per cent and 10 per cent off above list prices. To jobbers in lots of 100 or more prices are 25 per cent and 10 per cent and 5 per cent off above list prices.

#### Seamless Steel Commercial Boiler Tubes Basing Discounts and Differentials

##### HOT FINISHED

Size O. D. in Inches	Quantities Up to 10,000 Lb.		Quantities 10,000 Lb. to 24,999 Lb.		Quantities 25,000 Lb. to Carload— Consumer and Jobber	Carload or Over— Consumer and Jobber
	Consumer	Jobber	Consumer	Jobber		
*1 1/2	58 and 10	62 and 10	62 and 10	64 and 10	68 and 10	70 and 10
*1 3/4	Off	Off	Off	Off	Off	Off
2 and 2 1/4	23-5	27-5	27-5	27-5 and 5	31-5 and 5	33-5 and 5
2 1/2 and 2 3/4	30-5	34-5	34-5	34-5 and 5	38-5 and 5	40-5 and 5
3	37-5	41-5	41-5	41-5 and 5	45-5 and 5	47-5 and 5
3 1/4 and 3 1/2	40-5	44-5	44-5	44-5 and 5	48-5 and 5	50-5 and 5
4	42-5	46-5	46-5	46-5 and 5	50-5 and 5	52-5 and 5
4 1/2, 5, 5 1/2 and 6..	32-5	36-5	36-5	36-5 and 5	40-5 and 5	42-5 and 5

##### COLD DRAWN

	58 Per Cent	62 Per Cent	62 Per Cent	64 Per Cent	68 Per Cent	70 Per Cent
*1						
*1 1/4 and 1 1/2						
*1 3/4	Off	Off	Off	Off	Off	Off
2 and 2 1/4	17-5	21-5	21-5	21-5 and 5	25-5 and 5	27-5 and 5
2 1/2 and 2 3/4	24-5	28-5	28-5	28-5 and 5	32-5 and 5	34-5 and 5
3	31-5	35-5	35-5	35-5 and 5	39-5 and 5	41-5 and 5
3 1/4 and 3 1/2	34-5	38-5	38-5	38-5 and 5	42-5 and 5	44-5 and 5
4	36-5	40-5	40-5	40-5 and 5	44-5 and 5	46-5 and 5
4 1/2, 5, 5 1/2 and 6..	26-5	30-5	30-5	30-5 and 5	34-5 and 5	36-5 and 5

\*Off mechanical tubing list.

Basing point f.o.b. Pittsburgh.

No extra for lengths 1' 0" to 24' 0" inclusive.

# Important Reclassification of Flat-Rolled Steel

Confusion resulting from the absence of a clear-cut division between bars, plates, hot-rolled strip, hot-rolled sheets, hot-rolled annealed sheets and cold-rolled sheets will in the future be avoided, since each product is now clearly defined, as shown in the table.

	RANGES WIDTH AND GAGE, ALL INCLUSIVE				
HOT-ROLLED TO BE SOLD AS:	3½ in. and narrower	3-9/16 in. to 6 in.	6-1/16 in. to 23-15/16 in.	24 in. to 48 in.	48-1/16 in. and wider
Bars	0.250 in. and thicker	0.250 in. and thicker			
Plates			0.250 in. and thicker	0.250 in. and thicker	0.1875 in. and thicker
Hot-Rolled Strip	0.249 in. to 0.025 in.	0.249 in. to 0.035 in.	0.249 in. to 0.059 in.		
Hot-Rolled Sheets				0.249 in. to 0.059 in. (16 gage)	0.1874 in. to 0.059 in. (16 gage)
Hot-Rolled Annealed Sheets	0.024 in. and thinner (24 gage)	0.034 in. and thinner (21 gage)	0.058 in. and thinner (17 gage)	0.058 in. and thinner (17 gage)	0.058 in. and thinner (17 gage)
COLD-ROLLED TO BE SOLD AS:	12 in. and narrower		Over 12 in. to 23-15/16 in., incl.		24 in. and wider
Cold-Rolled Strip	All thicknesses		0.029 in. and thicker		
Cold-Rolled Sheets			0.028 in. and thinner	All thicknesses and gages	

NOTE: All cold-rolled material in coils, all gages and in widths up to and including 23-15/16 in. to be sold on cold-rolled strip base and card of extras.

## Hot-Rolled Sheets

Sheet prices are quoted at the following basing points: Pittsburgh, Gary, Ind., Birmingham and Pacific Coast ports. Base prices are as indicated in our price pages. Subject to extras per standard classification of extras for sheets.

## Hot-Rolled and Hot-Rolled Annealed— Size Extras, Cents Per 100 Lb.

### HOT-ROLLED AND HOT-ROLLED PICKLED (16 ga. and heavier)

	WIDTH, IN.				
	48	60	66	72	78
	to	to	to	to	to
12 ga. and heavier.....	15	20	25	35	35
13 ga. to 16 ga., inc. ....	15	25	30	..	..

### Hot-Rolled and Hot-Rolled Annealed Sheets— Gage Differentials

#### HOT-ROLLED SHEETS

Thickness Ordering Range, In.	Approx. Deci- mal Thick- ness, In.	Gage Number	Differentials per 100 lb.
0.193 to 0.249		6 and hvr.	BASE
0.177 to 0.192	0.1875	7	BASE
0.161 to 0.176	0.1719	8	BASE
0.146 to 0.160	0.1563	9	BASE
0.131 to 0.145	0.1406	10	BASE
0.115 to 0.130	0.125	11	Add 0.05
0.099 to 0.114	0.1094	12	Add 0.05
0.084 to 0.098	0.0938	13	Add 0.10
0.073 to 0.083	0.0781	14	Add 0.15
0.066 to 0.072	0.0703	15	Add 0.20
0.059 to 0.065	0.0625	16	Add 0.25

#### LENGTH, IN.

	144	192	216	30
	to	to	to	to
16 ga. and heavier....	5	5	10	15

### HOT-ROLLED ANNEALED AND HOT-ROLLED ANNEALED PICKLED (17 ga. and lighter)

#### WIDTH, In.

	Over										Under			
	32	36	40	44	48	52	56	60	64	68	24	12	6½	3½
	to	to	to	to	to	to	to	to	to	to	to	to	to	to
Gage ..36	40	44	48	52	56	60	64	68			Gage	12	6½	3½
17-18.	..	..	..	..	20	20	20	30	40	17-20	15	25	..	..
19-20.	..	..	..	..	20	20	30	40	50	21	15	25	50	..
21 ..	..	..	05	10	20	30	40	50	60	22	15	25	50	..
22 ..	..	10	15	25	40	60	80	..	..	23-24	15	25	50	1.00 1.50
23-24 ..	10	20	30	50	70	100	..	..	..	25-30	20	30	60	1.25 1.75
25-27 ..	15	30	50	60	..	..	..	..	..	..	..	..	..	..
28 ..	15	25	35	60	..	..	..	..	..	..	..	..	..	..
29 ..	20	35	..	..	..	..	..	..	..	..	..	..	..	..
30 ..	20	40	..	..	..	..	..	..	..	..	..	..	..	..

#### LENGTH, IN.

	Over				Under			
	124	144	168	30	124	144	168	30
	to	to	to	to	to	to	to	to
Gage	144	168	192	24	144	168	192	24
17-18 .....	10	15	25	15	10	15	25	15
19-21 .....	10	20	30	15	10	20	30	15
22-24 .....	10	25	35	15	10	25	35	15
25-27 .....	15	30	..	15	15	30	..	15
28-30 .....	20	..	..	15	20	..	..	15

Thickness ordering range given in the above table is for pricing purposes only and does not apply to thickness which governs allowable variations.



# Hot-Rolled, Hot-Rolled Pickled, Hot-Rolled Annealed and Hot-Rolled Annealed Pickled—

Miscellaneous Extras, Per 100 Lb.

## PICKLING EXTRAS:

	Pickling	Oiling
12 ga. and heavier.....	\$0.15	\$0.10
13-16 ga., inc. ....	0.20	0.10
17 ga. and lighter.....	0.35	0.10

## DRAWING EXTRAS:

12 ga. and heavier.....	\$0.15
13-21 ga., inc. ....	0.25
22 ga. and lighter.....	0.35

The above drawing extras are to apply wherever the customer requires the supplier to stand for a drawing hazard or surface disturbance.

Extra smooth (Hot rolled and hot rolled annealed unpickled only) ..... \$0.25

Blue Sheets	Steam or air blue, 25 ga. and lighter (hot rolled annealed only) .....	0.20
	Steam or air blue 24 ga. and heavier (hot rolled annealed pickled) .....	0.50
	Patent or stretcher leveled (not resquared).....	0.25

Resquaring—side and end and/or sides and ends—add 5 per cent of net item price at time of resquaring. Any sheet that comes within resquaring tolerance the resquaring extra must be added.

Tack plate quality (in addition to size extras).....	0.20
Oiling .....	0.10
Lime finish .....	0.10
Deoxidizing .....	0.15
Extra box annealing.....	0.15
Copper bearing steel.....	0.15

## CARBON EXTRAS:

Over 0.25 to 0.40 per cent.....	\$0.10
Over 0.40 to 0.60 per cent.....	0.25
Over 0.60 to 0.90 per cent.....	0.40

The mean of the range must determine the carbon extra; the range shall not be less than ten points (0.10).

Circle shearing extras on application.

Painting (sheets one coat).

### Red Oxide of Iron

17 to 18 ga. ....	\$0.15
19 to 24 ga. ....	0.20
25 to 28 ga. ....	0.25

### Priming Coat on Ceiling Stock

28 ga. ....	0.25
29 and 30 ga. ....	0.35

## HOT-ROLLED SHEETS 16 GA. AND HEAVIER

Hot pressing steel .....	\$0.10
Flange steel .....	0.15
Ordinary firebox steel.....	0.20
Locomotive firebox steel.....	0.50
U. S. Navy 48-S-5-D (Medium or soft).....	0.25
Regular sketches .....	0.20
Irregular sketches .....	0.50

## STANDARD SIZES

Hot rolled sheets	Hot Rolled Annealed Sheets
All gages	24 and heavier: Even gages
Widths: 24, 26, 28, 30, 36, 42, 48, 60; also 72 in. in gages heavier than No. 13.	26 and lighter: All gages
Lengths: 72, 84, 96, 120 and 144 in.	Widths: 24, 26, 28, 30, 36 in.
	Lengths: 72, 84, 96, 120 in.

## Quantity Extras Applying on Hot-Rolled and Hot-Rolled Annealed Sheets, No. 12 Gage and Lighter

### STANDARD SIZE QUANTITY EXTRAS IN CARLOAD LOTS

Any item of standard size ordered as part of carload but less than 10 bundles (approx. 1500 lb.) 10c. per 100 lb. extra for the item.—10 bundles or over (approx. 1500 lb.) in standard size, no charge.

### STANDARD SIZE QUANTITY EXTRAS IN LESS CARLOAD LOTS (total of order)

	Per 100 lb.
Less than 10 bdl. or 1500 lb.....	\$0.75
10 bdl. and less than 25 bdl. or 1500 lb. and less than 3750 lb. ....	0.50
25 bdl. and less than 100 bdl. or 3750 lb. and less than 15,000 lb. ....	0.25
100 bdl. or 1500 lb. up to carload.....	0.10
Bundles estimated at 150 lb. average.	

## ODD SIZE QUANTITY EXTRAS IN CARLOAD LOTS

Any item of odd size ordered as part of carload but less than 10 bdl. (approx. 1500 lb.) 10c. per 100 lb. extra for the item—10 bdl. or over (approx. 1500 lb.) in odd size, no extra.

## QUANTITY EXTRAS IN LESS CARLOAD LOTS

Each item of a size—Under 5,000 lb. to 2,500 lb.....	\$0.10
Under 2,500 lb. to 1,000 lb.....	0.25
Under 1,000 lb.....	0.50
For shipment of exact quantities .....	0.10

When odd sizes are ordered shipment of 10 per cent over or under each item of quantity ordered is permissible.

## CRATING EXTRAS PER 100 LB.

	Wrapping	Crating
350 to 500 lb. ....	\$0.10	\$0.40
300 to 349 lb. ....	0.20	0.50
250 to 299 lb. ....	0.20	0.60
200 to 249 lb. ....	0.20	0.70
150 to 199 lb. ....	0.20	0.80

Crates of less than 150 lb., \$1.75 per crate, for the crating, 40c. per crate for the wrapping.

Tight boxes, 350 to 500 lb.....\$0.60 per 100 lb.

Tight boxes, 350 to 500 lb., paper lined..... 0.70 per 100 lb.

All crates will contain 350 lb. to 500 lb. unless otherwise specified. No shipments will be wrapped unless so specified.

NOTE: Package approximately 5000 lb.....No Extra

## Cold-Rolled Sheets

### Heavy and Light Cold-Rolled Sheets—Gage Differentials

#### HEAVY COLD-ROLLED SHEETS

Thickness Ordering Range, in.	Approx. Decimal Thickness, in.	Gage Number	Differentials Per 100 Lb.
0.177 to 0.192	0.1875	7	Base
0.161 to 0.175	0.1719	8	Base
0.146 to 0.160	0.1563	9	Base
0.131 to 0.145	0.1406	10	Base
0.115 to 0.130	0.125	11	Add \$0.05
0.099 to 0.114	0.1094	12	Add 0.05
0.084 to 0.098	0.0938	13	Add 0.10
0.073 to 0.083	0.0781	14	Add 0.15
0.066 to 0.072	0.0703	15	Add 0.20
0.059 to 0.065	0.0625	16	Add 0.25

#### LIGHT COLD-ROLLED SHEETS

0.053 to 0.058	0.0563	17	Deduct \$0.15
0.047 to 0.052	0.050	18	Deduct 0.10
0.041 to 0.046	0.0438	19	Deduct 0.05
0.036 to 0.040	0.0375	20	Base
0.033 to 0.035	0.0344	21	Add 0.05
0.030 to 0.032	0.0312	22	Add 0.10
0.027 to 0.029	0.0281	23	Add 0.15
0.024 to 0.026	0.025	24	Add 0.20
0.0199 to 0.023	0.0219	25	Add 0.25
0.0178 to 0.0198	0.0188	26	Add 0.30
0.0161 to 0.0177	0.0172	27	Add 0.35
0.0146 to 0.0160	0.0156	28	Add 0.45
0.0131 to 0.0145	0.0141	29	Add 0.55
0.0115 to 0.0130	0.0125	30	Add 0.65

Thickness ordering range given in the above table is for pricing purposes only and does not apply to thickness which governs allowable variations.

Cold-rolled sheets must be sold with seconds arising up to the following percentages either included or in addition to tonnage on the order.

Price of seconds when shipped with prime orders shall be 10 per cent off net item prime price at basing point.

	Per Cent
0.036 in. and heavier, 42 in. wide and under .....	15
0.036 in. and heavier, over 42 to 48 in. ....	20
0.036 in. and heavier, over 48 in. ....	25
0.035 to 0.030 in., 36 in. wide and under .....	20
0.035 to 0.030 in., over 36 in. ....	35
0.029 in. and lighter, all widths .....	35

# Heavy and Light Cold-Rolled Sheets—Size Extras, Cents per 100 Lb.

Gage														Under
Widths, In.														
Over														
32	36	40	44	48	52	56	60	64	68	72	78	84	24	
to	to	to	to	to	to	to	to	to	to	to	to	to	to	
36	40	44	48	52	56	60	64	68	72	78	84	90	12	
16 and heavier ..	..	..	..	..	15	15	20	25	35	45	..	..	..	
17 and 18 .....	..	..	..	..	20	20	20	30	40	50	60	..	..	
19 and 20 .....	..	..	..	..	20	20	30	40	50	60	70	..	..	
21 .....	..	..	10	20	30	40	50	60	..	..	..	..	..	
22 .....	..	15	30	45	60	75	1.00	..	..	..	..	..	..	
23 and 24 .....	..	20	40	60	80	..	..	..	..	..	..	..	15	
25 and 27 .....	..	30	60	90	..	..	..	..	..	..	..	..	20	
28 .....	20	40	80	1.20	..	..	..	..	..	..	..	..	20	
29 .....	30	60	90	..	..	..	..	..	..	..	..	..	20	
30 .....	40	80	..	..	..	..	..	..	..	..	..	..	20	

Gage	Length, In.								Under
	Over								
	98	108	120	132	144	30	18	10	
	to	to	to	to	to	to	to	to	
	108	120	132	144	156	18	10	6	
16 and heavier . . . .	..	..	..	..	10	15	25	45	
17 and 18 . . . . .	..	..	10	10	15	15	25	45	
19 and 20 . . . . .	..	10	10	15	20	15	25	45	
21 and 22 . . . . .	10	15	20	25	30	15	25	45	
23 and 27 . . . . .	15	20	25	30	35	15	25	45	
28 and 30 . . . . .	20	25	30	35	40	15	25	45	

## Heavy and Light Cold-Rolled Sheets—Miscellaneous Extras, per 100 Lb.

### DRAWING QUALITY:

12 ga. and heavier	.....\$0.15
13 ga.—21 ga., inc.	..... 0.25
22 ga. and lighter	..... .35

The above drawing extras are to apply wherever the customer requires the supplier to stand for a drawing hazard or surface disturbance.

Hood top quality	.....\$0.25
Oiling	..... 0.10
Patent or stretcher leveled (not resquared)	..... 0.25
Resquaring—Add 5 per cent of net item price at time of resquaring.	

Any sheet that comes within resquaring tolerance, the resquaring extra must be added.

### QUANTITY EXTRAS:

Each item of a size—Under 5,000 lb. to 2,500 lb.	.....\$0.10
Under 2,500 lb. to 1,000 lb.	..... 0.25
Under 1,000 lb.	..... 0.50
For shipment of exact quantities 0.10	

When odd sizes are ordered shipment of 10 per cent over or under each item of quantity ordered is permissible.

### CRATING EXTRAS:

	Wrapping	Crating
350 to 500 lb.	\$0.10	\$0.40
300 to 349 lb.	0.20	0.50
250 to 299 lb.	0.20	0.60
200 to 249 lb.	0.20	0.70
150 to 199 lb.	0.20	0.80

Crates of less than 150 lb., \$1.75 per crate, for the crating, 40c. per crate for the wrapping.

Tight boxes, 350 to 500 lb.	..... \$0.60
Tight boxes, 350 to 500 lb., paper lined	..... 0.70

All crates will contain 350 to 500 lb. unless otherwise specified. No shipments will be wrapped unless so specified.

NOTE: Packages approximately 5000 lb. No Extra Other miscellaneous extras applicable to this grade, see under hot rolled, hot rolled pickled, hot rolled annealed and hot rolled annealed pickled miscellaneous extras.

## Galvanized Sheets

The only allowance to jobbers on sheets is a discount of \$2 a ton on stock or direct shipments of galvanized sheets and painted roofings and sidings. No deductions are to be made until buyers have qualified as jobbers and have signed code agreements with mills.

### Galvanized Sheets Gage Differentials

Gage	Per 100 lb.
10 & heavier	Deduct..... \$0.50
11	Deduct..... 0.45
12	Deduct..... 0.40
13	Deduct..... 0.35
14	Deduct..... 0.30
15 & 16	Deduct..... 0.25
17	Deduct..... 0.20
18 & 19	Deduct..... 0.15

20 & 21	Deduct..... 0.10
22 & 23	Deduct..... 0.05
24	base
25	Add..... 0.15
26	Add..... 0.25
27	Add..... 0.35
28	Add..... 0.50
29	Add..... 0.75
30	Add..... 1.00
31	Add..... 1.25
32	Add..... 1.50

## Standard Gages and Sizes

All Even Gages—Also No. 27 and No. 29 Gages.

Widths—24, 26, 28, 30 and 36 in.

Lengths—72, 84, 96 and 120 in.

## Galvanized Sheet Weight Table

Gage No.	In Ounces	In Lb.	Gage No.	In Ounces	In Lb.
	Avoldrupois	Avoldrupois		Avoldrupois	Avoldrupois
8	112.5	7.031	21	24.5	1.531
9	103.5	6.406	22	22.5	1.406
10	92.5	5.781	23	20.5	1.281
11	82.5	5.156	24	18.5	1.156
12	72.5	4.531	25	16.5	1.031
13	62.5	3.906	26	14.5	.906
14	52.5	3.281	27	13.5	.844
15	47.5	2.969	28	12.5	.781
16	42.5	2.656	29	11.5	.719
17	38.5	2.406	30	10.5	.656
18	34.5	2.156	31	9.5	.594
19	30.5	1.906	32	9.0	.563
20	26.5	1.656			

## Allowable Variations for Weight

No. 16 Gage and heavier	.....Plus or Minus 5 per cent
No. 17 to No. 22 gage inclusive	.....Plus or Minus 3½ per cent
No. 23 Gage and lighter	.....Plus or Minus 2½ per cent

## Table of Extras on Galvanized Sheets

Weights when ordered.

Heavier than Regular Commercial Coatings.

Extras based on Weight Test and Spelter at 5c. or lower.

Spelter Prices considered to be on E. St. Louis Base.

Gage	Commercial Ga.	Coatings Diff.	From 1.50 to 1.75 oz. Inc. per Sq. Ft.	Over 1.75 to 2.00 oz. Inc. per Sq. Ft.	Over 2.00 to 2.25 oz. Inc. per Sq. Ft.	Over 2.25 to 2.50 oz. Inc. per Sq. Ft.	Over 2.50 to 2.75 oz. Inc. per Sq. Ft.
			Per 100 lb.	Per 100 lb.	Per 100 lb.	Per 100 lb.	Per 100 lb.
25 Ga. & Lighter							
	Add \$0.40	Add \$0.60	Add \$0.80	Add \$1.00*	Add \$1.20		
* See Note							
24	0.25	0.35	0.45	0.55*	0.65		
21-23	0.25	0.35	0.45	0.55	0.65		
19-20	0.25	0.35	0.45	0.55	0.65		
18	0.25	0.35	0.45	0.55	0.65		
15-17		0.25	0.25	0.30	0.35		
12-14	None	0.25	0.25	0.30	0.35		
10-11	None	0.25	0.25	0.30	0.35		

## For Additional Advances of 1c. per lb. for Spelter

When Spelter is 6c. per lb. add 20 per cent to extra for coating stipulated.

When Spelter is 7c. per lb. add 40 per cent to extra for coating stipulated.

When Spelter is 8c. per lb. add 60 per cent to extras for coating stipulated.

When Spelter is 9c. per lb. add 80 per cent to extras for coating stipulated.

When Spelter is 10c. per pound add 100 per cent to extra for coating stipulated.

NOTE:—When the maximum coating in a given column is demanded—use the extra shown in the next higher column. Example: If 2 oz. minimum is desired use extra shown in "Over 2.00 to 2.25 oz" column.

NOTE:—Use nearest even cent of the F.O.B. East St. Louis quotation for spelter of the most recent issue of the *American Metal Market*; if the quotation is even half-cent, use the next higher even cent. If a range is given, and the minimum of the range is even half-cent or more, use the next higher even cent;



# Galvanized Sheets Size Extras (Per 100 Lb.)

## WIDTH (INCHES)

GAGE	OVER										UNDER		
	32 to 36	36 to 38	38 to 40	40 to 42	42 to 44	44 to 46	46 to 48	48 to 50	50 to 52	52 to 54	24 to 12	12 to 6	6 to under
12 Ga. and hvr. ....	.....	.....	.....	\$0.05	\$0.10	\$0.20	\$0.20	\$0.30	\$0.35	\$0.40	\$0.20	\$0.25	\$0.50
13-15 .....	.....	.....	.....	0.05	0.10	0.20	0.20	0.30	0.35	0.40	0.20	0.25	0.50
16 .....	.....	\$0.05	\$0.05	0.05	0.10	0.20	0.20	0.30	0.35	0.45	0.20	0.25	0.50
17-18 .....	.....	0.05	0.05	0.05	0.10	0.20	0.25	0.35	0.40	0.55	0.20	0.30	0.60
19-21 .....	.....	0.10	0.15	0.15	0.30	0.35	0.40	0.45	0.50	0.75	0.20	0.30	0.80
22 .....	.....	0.20	0.30	0.35	0.45	0.55	0.65	0.80	0.90	1.15	0.20	0.30	0.60
23-24 .....	.....	0.25	0.35	0.45	0.55	0.65	0.75	0.90	1.00	.....	0.20	0.30	0.60
25-26 .....	.....	0.30	0.45	0.65	0.75	0.85	1.00	.....	.....	.....	0.25	0.35	0.70
27 .....	\$0.05	0.40	0.50	0.70	0.80	1.00	1.25	.....	.....	.....	0.25	0.35	0.70
28 .....	0.20	0.50	0.65	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70
29-30 .....	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70
31 .....	0.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70
32 .....	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70

If minimum of the range is less than half-cent, use next lower even cent.

## Spot Test

If coating is to be subjected to spot test, add 25 per cent to gross extra for the coating stipulated.

## Galvanized Sheets Miscellaneous Extras

Stretcher leveling .....	\$0.40 Per 100 Lb.
Resquaring—(If not stretcher leveled) ....	7½ per cent
Resquaring—(If stretcher leveled) .....	12½ per cent
Windmill quality (stiff) .....	0.15 Per 100 Lb.
Copper bearing .....	0.15 Per 100 Lb.

## DRAWING EXTRAS:

Per 100 Lb.

12 Gage and heavier .....	\$0.15
13 to 21 Gage, inclusive .....	0.25
22 Gage and lighter .....	0.35
Drawing extras apply if responsible for drawing hazard or surface disturbance.	
Circle extras on application.	

## Galvanized Seconds

Seconds arising in the production of galvanized sheets when shipped with primes (but not roofing sizes) and not to exceed 5 per cent of total quantity shipped shall be sold at 50c. for 25 gage and lighter, and 75c. for 24 gage and heavier less than item price of primes.

Seconds and wasters are not to be sold to any buyer for conversion into roofing.

## Long Terne Sheets

Long terne sheets, unassorted, 8-lb. coating are quoted at 290c., Pittsburgh. Long terne seconds, when shipped with primes are 50c. per 100 lb. less than price for primes with seconds arising.

## Long Terne Sheets—Gage Differentials

Gage No.		Per 100 lb.
12 .....	Deduct .....	\$0.40
13 .....	Deduct .....	0.35
14 .....	Deduct .....	0.30
15 .....	Deduct .....	0.25
16 .....	Deduct .....	0.25

## Size Extras, Per 100 Lb.

Gage	OVER										UNDER		
	32 to 36	36 to 38	38 to 40	40 to 42	42 to 44	44 to 46	46 to 48	48 to 50	50 to 52	52 to 54	24 to 12	12 to 6	6 to under
12 Ga. & hvr. ....	.....	.....	.....	\$0.05	\$0.10	\$0.20	\$0.20	\$0.30	\$0.35	\$0.40	\$0.20	\$0.25	\$0.50
13-15 .....	.....	.....	.....	0.05	0.10	0.20	0.20	0.30	0.35	0.40	0.20	0.25	0.50
16 .....	.....	\$0.05	\$0.05	0.05	0.10	0.20	0.20	0.30	0.35	0.45	0.20	0.25	0.50
17-18 .....	.....	0.05	0.05	0.05	0.10	0.20	0.25	0.35	0.40	0.55	0.20	0.30	0.60
19-21 .....	.....	0.10	0.15	0.15	0.30	0.35	0.40	0.45	0.50	0.75	0.20	0.30	0.60
22 .....	.....	0.20	0.30	0.35	0.45	0.55	0.65	0.80	0.90	1.15	0.20	0.30	0.60
23-24 .....	.....	0.25	0.35	0.45	0.55	0.65	0.75	0.90	1.00	.....	0.20	0.30	0.60
25-26 .....	.....	0.30	0.45	0.65	0.75	0.85	1.00	.....	.....	.....	0.25	0.35	0.70
27 .....	\$0.05	0.40	0.50	0.75	0.80	1.00	1.25	.....	.....	.....	0.25	0.35	0.70
28 .....	0.20	0.50	0.65	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70
29-30 .....	0.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.25	0.35	0.70

## LENGTH (INCHES)

GAGE	OVER					UNDER	
	124 to 144	144 to 156	156 to 168	168 to 192	192 to 216	60 to 30	30 to 18
12 Ga. and hvr. ....	\$0.25	\$0.50	\$0.75	\$0.75	\$0.10	\$0.20	\$0.20
13-15 .....	.....	0.25	0.50	0.75	.....	0.10	0.20
16 .....	.....	0.25	0.50	0.75	.....	0.10	0.20
17-18 .....	\$0.10	0.50	0.75	.....	.....	0.20	0.30
19-21 .....	0.10	0.50	0.75	.....	.....	0.20	0.30
22 .....	0.10	0.50	0.75	.....	.....	0.20	0.30
23-24 .....	0.10	.....	.....	.....	.....	0.20	0.30
25-26 .....	0.10	.....	.....	.....	.....	0.25	0.35
27 .....	0.10	.....	.....	.....	.....	0.25	0.35
28 .....	0.10	.....	.....	.....	.....	0.25	0.35
29-30 .....	0.10	.....	.....	.....	.....	0.25	0.25
31 .....	.....	.....	.....	.....	.....	0.25	0.35
32 .....	.....	.....	.....	.....	.....	0.25	0.35

17 .....	Deduct .....	0.20
18 .....	Deduct .....	0.15
19 .....	Deduct .....	0.15
20 .....	Deduct .....	0.10
21 .....	Deduct .....	0.10
22 .....	Deduct .....	0.05
23 .....	Deduct .....	0.05
24 Unassorted .....	BASE .....	BASE
25 .....	Add .....	0.15
26 .....	Add .....	0.25
27 .....	Add .....	0.35
28 .....	Add .....	0.50
29 .....	Add .....	0.75
30 .....	Add .....	1.00

When estimating weight per square foot of long terne sheets use hot rolled annealed weights.

The grade on which the base price is predicated is 8 lb. to 12 lb. coating.

## Long Terne Sheets—Size Extras (Per 100 Lb.)

### LENGTH (INCHES)

Gage	OVER					UNDER	
	124 to 144	144 to 156	156 to 168	168 to 192	192 to 216	60 to 30	30 to 18
16 Ga. & hvr. ....	.....	\$0.25	\$0.50	\$0.10	\$0.20	\$0.20	\$0.20
17-18 .....	\$0.10	0.50	0.75	0.20	0.30	0.20	0.30
19-21 .....	0.10	0.50	0.75	0.20	0.30	0.20	0.30
22 .....	0.10	0.50	.....	0.20	0.30	0.20	0.30
23-24 .....	0.10	.....	.....	0.20	0.30	0.20	0.30
25 Ga. & Ltr. ....	0.10	.....	.....	0.25	0.35	0.25	0.35

MISCELLANEOUS EXTRAS		Per 100 lb.
12 lb. coating.....	Add.....	\$0.35
15 lb. coating.....	Add.....	0.50
Coatings heavier than 15 lb. can be finished on orders amounting to 75 tons or more. The following extras per 100 lb. apply:		

GAGE	20 lb.
30	\$1.50
29	1.40
28	1.30
27 & 26	1.20
24 & 25	1.00
22 & 23	0.90
20 & 21	0.80

Full Finish .....	Extra per 100 lb. \$0.50
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DRAWING QUALITY		
12 Ga. & heavier .....		\$0.15
13 Ga.-21 Ga. inc. ....		0.25
22 Ga. & lighter .....		0.35

Patent or stretcher leveled (not resquared).....	Extra per 100 lb. \$0.40
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Resquaring—side and end and/or sides and ends add 7½ per cent of net item price at time of resquaring. Any sheet that comes within resquaring tolerance the resquaring extra must be added.	
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Copper bearing steel .....	\$0.15
Primes only .....	0.20
Primes with seconds arising .....	0.10

### Porcelain Enameling Sheets

Porcelain Enameling Sheets—Gage Differentials  
16 Ga. and Heavier

Gage No.	Per 100 lb.
10.....	BASE
11 and 12 .....	Add \$0.05
13.....	Add 0.10
14.....	Add 0.15
15.....	Add 0.20
16.....	Add 0.25
17 Ga. and Lighter	
17.....	Deduct 0.15
18.....	Deduct 0.10
19.....	Deduct 0.05
20.....	BASE
21.....	Add 0.05
22.....	Add 0.10
23.....	Add 0.15
24.....	Add 0.20
25.....	Add 0.25
26.....	Add 0.30

### SIZE EXTRAS, CENTS PER 100 LB.

WIDTH, IN.		Over	Under
Gage	32 36 40 44 48 52 56 60 64 68 72 78	to to to to to to to to to to to to	to to to to to to to to to to to to
16 and heavier ..	.. .. .	15 15 20 25 35 45 ..	10
17 and 18 .....	.. .. .	20 20 20 30 40 50 60 ..	10
19 and 20.....	.. .. .	20 20 30 40 50 60 70 ..	10
21 .....	.. .. .	10 20 30 40 50 60 ..	15
22 .....	.. .. .	15 30 45 60 75 1.00 ..	15
23 and 24 .....	.. .. .	20 40 60 80 ..	15
25 and 27 .....	.. .. .	30 60 90 ..	20
28 .....	.. .. .	20 40 80 1.20 ..	20
29 .....	.. .. .	30 60 90 ..	20
30 .....	.. .. .	40 80 ..	20

LENGTH, IN.		Over	Under
Gage	96 108 120 132 144 156	to to to to to to	to to to to to to
16 and heavier ..	.. .. .	10 15 25 45	
17 and 18 .....	.. .. .	10 15 25 45	
19 and 20 .....	.. .. .	10 15 25 45	
21 and 22.....	.. .. .	10 15 25 45	
23 and 27 .....	.. .. .	15 20 25 30 35	15 25 45
28 and 30 .....	.. .. .	20 25 30 35 40	15 25 45

### Miscellaneous Extras

Drawing quality, quantity extras, crating extras, shearing circles and other miscellaneous extras applicable to this grade may be found among miscellaneous extras under the hot rolled sheet products.

### Tin Plate

Coke tin plate is quoted at \$4.65, Pittsburgh; \$4.75, Gary, and \$5.30 f.o.b. cars, dock, Pacific Coast Ports, all per base, box of 100 lb., primes. From these published prices, producers are permitted by a provision in Section 4, Schedule E in the steel code, in quoting customers, to allow a fixed differential to large buyers. In figuring such prices, the cash discount of 2 per cent (if paid within 10 days) on the basing point value must be used in spite of any other provision to the contrary.

The carload stock plate price is 60c. under the published prices or \$4.05, Pittsburgh; base \$4.15, Gary, and \$4.70, f.o.b. cars dock, Pacific Coast Ports.

The price of tin plate will be quoted per base box of 112 sheets 14 x 20 in., prime cokes weighing 100 lb. at controlling basing point, adding the all rail published tariff freight charges, adjusted for tare, from that basing point to place of delivery. Should place of delivery be at a basing point, switching charges from the producing plant nearest place of delivery will be added to base price to determine the delivered base price. In any case where delivery is made by other than all-rail transportation, adjustment in price will be made in accordance with the rates approved by the board of directors of the American Iron and Steel Institute.

Rates of discount for early payment and maximum periods of free credit are as follows: Pacific Coast deliveries made direct from eastern plants: Discount—½ of 1 per cent in 25 days, from date of invoice, and free credit—45 days from date of invoice; for all other deliveries: Discount—½ of 1 per cent in 10 days, from date of invoice, and free credit—30 days from date of invoice. The date of invoice will be the date of shipment. Discount shall be allowed only on the basing point value of the material. Interest is to be charged and collected for all unpaid invoices from and after expiration of free credit.

### Basis Weight Differentials on Tin Plate

Basis weight	Tare (wood boxes)	Cokes deduct	"A" Charcoals add
55 lb.	5 lb.	\$0.40	\$0.60
60 lb.	5 lb.	.375	.60
65 lb.	5 lb.	.35	.60
70 lb.	5 lb.	.30	.60
75 lb.	5 lb.	.25	.60
80 lb.	5 lb.	.20	.60
85 lb.	5 lb.	.15	.60
90 lb.	5 lb.	.10	.60
95 lb.	6 lb.	.05	.60
100 lb.	6 lb.	BASE	.75
		Add	
107 lb.	6 lb.	.15	.75
112 lb.	6 lb.	.25	.75
128 lb.	7 lb.	1.00	1.25
135 lb.	7 lb.	1.15	1.25
148 lb.	8 lb.	1.85	1.50
155 lb.	8 lb.	2.00	1.50
168 lb.	9 lb.	2.70	1.75
175 lb.	9 lb.	2.85	1.75
188 lb.	9 lb.	3.55	2.00
195 lb.	9 lb.	3.70	2.00

Weights other than regular are priced by adding to the price of the next lower regular basis weight an amount obtained by multiplying the odd number of lb. by 4c. for cokes and 6c. for "A" charcoals. The price of the next higher regular weight, however, to be the maximum price for any intermediate odd weight.

Note: Tare weights other than unit wooden boxes—add 2 lb. per base box.

Note: Package prices of other than the base size are arrived at by using the ratio carried to the fourth decimal point.

If result shows an even ½c. or less, the fraction is dropped. If over ½c. add 1c.

### Tin Plate Extras

Per base box unless otherwise noted	
Unassorted cokes .....	deduct \$0.05
Unassorted "A" charcoals.....	deduct .15
Cokes—best .....	add .25
Cokes—Kanners Special .....	add .40
Silvered tin—90 lb. to 195 lb. basis.....	add 1.00
(All seconds must be taken)	

UNILASTIC or loose loading.....	deduct .10
This contemplates standard skids; viz. not over 4 in. in height.	
For skids over 4 in.....	deduct .05



## COPPER BEARING:

100 lb. basis and lighter.....add	.15
Over 100 lb. basis .....	.15 per 100 lb.

## SECONDS:

Cokes—112 lb. and lighter.....deduct	.25
Cokes—113 lb. to 195 lb. inc.....deduct	.35
"A" charcoals—112 lb. and lighter...deduct	.50
"A" charcoals—113 lb. to 195 lb. inc. deduct	.75

## PRIMES ONLY:

Cokes—all sizes— 55 to 135 lb.....add	.10
Cokes—all sizes—136 to 195 lb.....add	.20
Best cokes and kanners Special—	
55 lb. to 135 lb.....add	.20
136 lb. to 195 lb.....add	.40
"A" Charcoals—all sizes—	
55 lb. to 135 lb.....add	.25
136 lb. to 195 lb.....add	.40

## DEEP DRAWING:

100 lb. basis and lighter.....add	.25
Over 100 lb. basis.....add	.25 per 100 lb.

Note: The above drawing extra applies to material intended for the following list of articles, or any other article wherever the customer holds the supplier responsible for a fabricating hazard, or a hazard due to surface disturbances, including any article lighter than 100 lb. basis where the depth is as great as the diameter:

Double or triplet rings and plugs.  
Drawn screw caps and necks—28 mm. or less.  
Nozzles and spouts.  
Muffin pans (battery type).  
Lantern parts (base, chimney and collar).  
Oval can tops and breasts for talcum and oil cans and similar fabrications.  
Fixture sockets.  
Sprayer cups.  
Formaldehyde cans (taper drawn).  
Sterno heat can body.  
Denver shells.  
Drawn bread pans.  
Dish pans.  
Hydrator pans.

## QUANTITY:

Cokes and "A" Charcoals	
195 lb. and lighter	
Under 100 to 50 base boxes .....	add \$0.10
Under 50 base boxes .....	add .25
Minimum quantity—10 base boxes per item.	

Note: To avoid quantity extra, the amount without extra must be ordered for shipment at one time.

## RESQUARING:

Same extras as apply to tin mill black.

## DIRECT SHIPMENT:

An extra charge of 10c. per package will be made on all shipments direct to jobbers' customers, of less than 50 base boxes to 10 base boxes.  
for shipments of less than 10 base boxes, an extra charge of 20c. per package will be made.

## SHEETAGE:

Items ordered packed half the customary number of sheets per box .....

## TISSUE PACKING:

All weights in coke, best coke and Kanners Special grades and lighter than 148 lb. base in "A" Charcoal when ordered packed in tissue paper will carry an extra charge of 8c. per package of 56 sheets, or 15c. per package of 112 sheets. Weights 148 lb. base and heavier "A" Charcoal grade will be packed in tissue paper without extra charge.

## TIN LINING:

All per base box ..... 25c.  
Minimum charge—25c. per package.  
Where customer specifies for other than 112 sheets per package, the ratio for 112 sheets is to be used.

## STRAPPING BOXES:

Corners only—5c. per package.

## WIRING BOXES:

10c. per package.  
All local shipments of 8000 lb. and less, gross weight, must be wired and our regular extra of 10c. per package will apply.

## PAPER LINING:

Ordinary paper (one sheet top and bottom)—add 3c. per package.

## Width and Length Extras on Tin Plate

Cokes and "A" Charcoals over 30 in. wide or 33 in. long take the following extras per in. or fraction thereof:

	Widths	Lengths
55 lb. to 70 lb.	15c. basis	5c. basis
75 lb. to 85 lb.	10c. basis	4c. basis
90 lb. to 195 lb.	5c. basis	2c. basis

On dimensions under 10 in. regular black plate size extras should apply.

## Stock Tin Plate

No primes may be sold as seconds. The base price at Pittsburgh to consumers is \$4.05 per base box of 100 lb. primes. Stock plates may be described as cut-downs, over-runs, miscuts, rejections warming up stock, seconds on primes only orders, or excess material accumulated through any other legitimate means of operation. Warming up stock and cut-downs should be limited to the following sizes:

	Basis	Weights
*14 in. x 18 $\frac{1}{2}$ in.....	107 lb. and 135 lb.	
14 in. x 20 in.....	All weights	
14 in. x 28 in.....	" "	
*14 $\frac{1}{2}$ in. x 18 $\frac{1}{2}$ in.....	107 lb. and 135 lb.	
18 in. x 18 in.....	All weights	
*18 $\frac{1}{2}$ in. x 28 in.....	107 lb. and 135 lb.	
*20 in. x 30 in.....	All weights	
20 in. x 28 in.....	" "	
22 in. x 22 in.....	" "	
24 in. x 24 in.....	" "	

\*Seconds only to be reported as stock.

## Tin Mill Black Plate

Tin mill black plate is quoted at 2.50c. per lb., base Pittsburgh, 2.60c. per lb., base Gary, and 3.20c. a lb., f.o.b. cars on dock at Pacific Coast ports.

## Hot-Rolled and Annealed—Gage Differential

Nos. 15-16 gage.....	Deduct \$0.20 per 100 lb.
Nos. 17-21 gage.....	Deduct 0.15 per 100 lb.
Nos. 22-24 gage.....	Deduct 0.10 per 100 lb.
Nos. 25-27 gage.....	Deduct 0.05 per 100 lb.
No. 28 gage.....	Base
No. 29 gage.....	Add 0.10 per 100 lb.
No. 30 gage.....	Add 0.20 per 100 lb.

FOR BETTER GRADES OF TIN MILL BLACK, add to hot rolled and annealed prices as follows:

Milk can stock .....	\$0.75 per 100 lb.
Nickel plating stock .....	1.00 per 100 lb.
Pickled and annealed .....	0.40 per 100 lb.
Pickled, annealed, cold rolled and annealed (full finish) .....	0.50 per 100 lb.
Show card stock .....	0.75 per 100 lb.
Show card stock, special .....	1.00 per 100 lb.
Stove pipe stock, blued .....	0.20 per 100 lb.
Tea tray stock .....	0.75 per 100 lb.
Tea tray stock, special .....	1.00 per 100 lb.
Extra annealing .....	0.15 per 100 lb.
Deoxidizing .....	0.15 per 100 lb.
Oiling .....	0.10 per 100 lb.
Welding quality .....	0.10 per 100 lb.

DRAWING QUALITY—Add 25c. per 100 lb. (regardless of gage)

NOTE—The above drawing extra applies to material intended for any article wherever the customer holds the supplier responsible for a fabricating hazard, or a hazard due to surface disturbance.

## QUANTITY—

Items less than 5,000 lb. to 2,500 lb.	Add 0.10 per 100 lb.
Items less than 2,500 lb. to 1,000 lb.	Add 0.25 per 100 lb.
Items less than 1,000 lb.....	Add 0.50 per 100 lb.

## BOXING—

	Up to 24 in. wide	Over 24 in. to 30 in. wide
Under 40 in. long.....	\$0.20	\$0.30
40 in. to 45 in. long.....	0.30	0.40
Over 45 in. long.....	0.40	0.50

RESQUARING—	Ends	Ends and Sides
No. 28 gage and heavier..	\$0.15 per 100 lb.	\$0.20 per 100 lb.
Lighter than No. 28 gage..	0.20 per 100 lb.	0.30 per 100 lb.

ROLLER LEVELING—.....Add \$0.10 per 100 lb.

#### STRAPPING BOXES—

Double strapping..... Add \$0.10 per pkg.  
(Boxes strapped all around)

#### DIRECT SHIPMENT—

On all shipments to jobbers' customers in lots of less than 5000 lb., Add \$0.10 per 100 lb.

LOADING ON WOODEN PLATFORMS—Add \$0.05 per 100 lb.

#### WIDTH AND LENGTH EXTRAS—

GAUGE	WIDTH	LENGTHS
Nos. 15 to 31	14 in. to 30 in. None	14 in. to 60 in. None
	Over 30 in. to 32 in. 10c.	Over 60 in. to 72 in. 10c.
	Under 14 in. to 10 in. 15c.	Over 72 in. to 84 in. 20c.
	Under 10 in. to 6 in. 25c.	Under 14 in. to 10 in. 15c.
	Under 6 in. to 4 in. 35c.	

#### SPECIAL DISCOUNT FOR PACIFIC COAST JOBBERS

Special commercial regulation No. 3 provides special terms of payment for Pacific Coast jobbers on products from Eastern plants. In accordance with section 6, schedule E, of the code, the regulation was made necessary by the fact that the time in transit for products shipped to the Coast from plants east of the Mississippi River may be more than 25 days. A special maximum rate of discount for early payment of one-half of 1 per cent of the invoiced value of such products, if the invoice thereof shall be paid within 40 days from the date of such invoice, is provided, and a special maximum period of free credit of 60 days from the date of such invoice is also allowed.

### Hot-Rolled Strip Steel

Hot-rolled strip steel is quoted at 1.65c. a lb., base Pittsburgh, and at 1.75c. a lb., base Chicago. Subject to extras per standard classification of extras on hot-rolled strip steel.

#### EXTRA FOR CUTTING TO SPECIFIED LENGTH PER 100 LB.

	Under 2000 Lb.	Under 1500 Lb.	Under 1000 Lb.	Under 500 Lb.
Cutting to length of 60 in. and over...	No Charge	10c.	20c.	40c.
Cutting to lengths over 48 and under 60 in.	5c.	20c.	30c.	50c.
Cutting to lengths over 24 to 48 in., inc.	15c.	25c.	35c.	55c.
Cutting to lengths over 12 to 24 in., inc.	30c.	40c.	50c.	70c.

Extra for cutting to specified lengths 12 in. and less will be furnished on application.

#### QUALITY EXTRAS PER 100 LB.

Tack plate quality .....	20c.
Tight cooperage hoop .....	10c.
Locomotive firebox steel .....	50c.
Ordinary firebox steel .....	20c.
Flange steel, boiler quality .....	15c.
Hot pressing steel (not flange steel for boilers) .....	10c.
Forging quality (when specified) .....	25c.
Hull material subject to U.S. Navy Dept., specification for medium or soft steel .....	25c.

#### SKETCHES AND CIRCLES PER 100 LB.

(Not requiring re-entrant cutting)

Regular sketches (with not more than four straight edges) including straight taper plates .....	20c.
Irregular sketches (with more than four straight edges) .....	50c.
Sketches furnished to a radius .....	50c.
Circles: Extras quoted on application.	
Semi-circles: Extras quoted on application.	

Extras for sketches requiring re-entrant cutting quoted on application.

When sketches or circles are required to be flame cut, the above extras will apply in addition to regular flame cutting extras.

#### QUANTITY DIFFERENTIALS

All specifications for less than 6000 lb. of a size will be subject to the following "lump sum" extras for handling and assembling. These extras to be added to the net price of the material and to be determined by the total weight of a size ordered, for shipment at one time.

Less than 6000 lb. to 4000 lb.....	\$2 lump sum
Less than 4000 lb. to 2000 lb.....	4 lump sum
Less than 2000 lb. to 1000 lb.....	8 lump sum
Less than 1000 lb.....	12 lump sum

#### DRAWING EXTRAS PER 100 LB.

For all items of hot rolled strip on which the supplier must stand for a drawing hazard of breakage or of rejection for surface disturbance in accordance with trade customs, the following drawing extras to be charged:

12 ga. and heavier.....	15c.
13 ga. and heavier.....	25c.

The above also applies wherever the customer specifies hot rolled strip to be normalized or box annealed.

Oil pans (or crank cases) are a type of product requiring the drawing extra.

The specifications requiring guaranteed case carburizing qualities to meet McQuade-Ehn tests, carry an extra of 60c. per 100 lb.

#### SPECIAL NOTES

Unless forging quality is specified hot rolled strip shall be furnished to ladle analysis only.

No allowance for uncropped coils.

#### EXTRAS FOR CHEMICAL SPECIFICATIONS PER 100 LB.

##### CARBON:

The mean of the range agreed upon between the purchaser and the manufacturer shall determine the extra.

	0.076 in. and Hvr.	0.075 in. and Ltr.
Over 0.25 to 0.40 per cent	5c.	10c.
Over 0.40 to 0.60 per cent	10c.	25c.
Over 0.60 to 1.00 per cent	15c.	40c.
Over 1.00 per cent.....	On application	On application

##### MANGANESE:

The mean of the range agreed upon between the purchaser and the manufacturer shall determine the extra.

0.30 to 0.90 per cent.....	No extra
0.91 to 1.15 per cent.....	10c.
1.16 to 1.35 per cent.....	20c.
1.36 to 1.50 per cent.....	25c.

NOTE: When the mean of the range agreed upon is above 1.15, the extras shall apply only to steel with maximum carbon specified 0.20 or higher. Prices for exceptions made by this note will be quoted on application.

##### SILICON:

The mean of the range agreed upon between the purchaser and the manufacturer shall determine the extra.

Minimum not specified....	No extra
Up to 0.25 per cent, inc....	10c.
0.26 to 0.50 per cent, inc....	20c.

##### PHOSPHORUS:

Minimum not specified....	No extra
Up to 0.08 per cent, minimum, inc. ....	5c.

NOTE: Phosphorus extra applies to open-hearth steel only.

##### SULPHUR:

Minimum not specified .....	No extra
Up to 0.10 per cent, minimum, inc.	10c.
0.11 to 0.20 per cent, minimum, inc.	17½c.
0.21 to 0.30 per cent, minimum, inc.	25c.

##### COPPER:

Copper bearing .....	15c.
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### Hot-Rolled Strip Steel

STANDARD EXTRAS—SUBJECT TO CHANGE WITHOUT NOTICE

BASE PRICE: Per 100 lb., 0.25% carbon and under, in coils or cut lengths 5 ft. and over, including short ends.

EXTRAS TO BE ADDED TO BASE PRICE:

Gage	Decimal, in.	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
to	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to	to
Width, in.	0.191	0.180	0.162	0.146	0.132	0.118	0.105	0.090	0.076	0.068	0.061	0.054	0.047	0.041	0.035	0.032	0.028	0.025
3/16	1.45	1.45	1.45	1.50	1.60	1.60	1.70	1.80	2.00	2.20	2.40	2.60	2.85	3.20	3.60	4.00	4.40	4.75
7/16	1.25	1.25	1.25	1.25	1.35	1.40	1.50	1.60	1.70	1.85	2.05	2.25	2.45	2.75	3.10	3.45	3.85	4.25
1/2	1.05	1.05	1.05	1.05	1.10	1.10	1.20	1.25	1.35	1.45	1.55	1.75	1.95	2.15	2.35	2.75	3.25	3.75
9/16	0.85	0.85	0.85	0.85	0.90	0.90	1.00	1.05	1.10	1.15	1.25	1.35	1.55	1.75	1.95	2.35	2.75	3.25
5/8	0.70	0.70	0.70	0.70	0.75	0.75	0.85	0.90	0.95	1.00	1.05	1.15	1.25	1.45	1.65	1.95	2.35	2.75
3/4	0.55	0.55	0.55	0.55	0.60	0.60	0.70	0.75	0.85	0.90	0.95	1.05	1.15	1.35	1.55	1.85	2.25	2.65
7/8	0.45	0.45	0.45	0.45	0.50	0.50	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.05	1.25	1.55	1.85
1 to 1 1/8	0.35	0.35	0.35	0.35	0.40	0.40	0.50	0.55	0.60	0.60	0.65	0.65	0.75	0.85	0.95	1.15	1.45	1.65
1 1/8 to 2	0.30	0.30	0.30	0.30	0.35	0.35	0.40	0.45	0.45	0.45	0.50	0.55	0.60	0.70	0.90	1.15	1.35	1.65
2 1/8 to 2 1/2	0.25	0.25	0.25	0.25	0.30	0.30	0.35	0.40	0.40	0.40	0.45	0.55	0.70	0.85	1.05	1.20	1.40	1.70
2 1/2 to 3	0.20	0.20	0.20	0.20	0.25	0.25	0.30	0.35	0.35	0.40	0.45	0.55	0.70	0.90	1.15	1.25	1.45	1.70
3 to 3 1/2	0.15	0.15	0.15	0.15	0.20	0.20	0.25	0.30	0.35	0.35	0.45	0.60	0.75	0.95	1.20	1.30	1.50	1.75
3 1/2 to 4	0.15	0.15	0.15	0.15	0.20	0.20	0.25	0.30	0.35	0.40	0.50	0.65	0.85	1.05	1.25	...	...	...
4 1/2 to 5	0.10	0.10	0.10	0.10	0.15	0.15	0.20	0.25	0.30	0.40	0.55	0.75	0.95	1.15	1.35	...	...	...
5 1/2 to 6	0.10	0.10	0.10	0.10	0.15	0.15	0.20	0.25	0.30	0.40	0.55	0.75	0.95	1.20	1.40	...	...	...
6 1/2 to 8	0.05	0.05	0.05	0.05	0.10	0.10	0.15	0.20	0.25	0.35	0.45	...	...	...	...	...	...	...
8 1/2 to 10	0.05	0.05	0.05	0.05	0.10	0.10	0.15	0.20	0.25	0.35	0.40	...	...	...	...	...	...	...
10 1/2 to 12	0.05	0.05	0.05	0.05	0.10	0.10	0.15	0.20	0.25	0.30	0.35	...	...	...	...	...	...	...
12 1/2 to 15	base	base	base	0.05	0.05	0.10	0.10	0.15	0.15	0.25	0.30	...	...	...	...	...	...	...
15 1/2 to 20	base	base	base	0.05	0.05	0.10	0.10	0.15	0.15	0.20	0.25	...	...	...	...	...	...	...
20 1/2 to 23 1/8	base	base	base	0.05	0.05	0.10	0.10	0.15	0.15	0.20	0.25	...	...	...	...	...	...	...

#### PICKLING—

Under 1 1/2 in.	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.70	0.70	0.70	0.70	0.90	0.90	0.90	0.90	1.25	1.25	1.25
1 1/2 to 5 in.	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.55	0.55	0.55	0.55	0.70	0.70	0.70	0.70	1.05	1.05	1.05
5 1/2 to 23 1/8 in.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.35	0.35	0.35	0.35	0.45	0.45	0.45	0.45	...	...	...

#### SPLITTING—

1 1/2 in. and wider	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.55	0.55	0.55	...	...	...
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### Cold-Rolled Strip Steel

Cold-rolled strip steel is quoted at 2.25c. a lb., base Pittsburgh or Cleveland, and at 2.45c. a lb., base Worcester, Mass. Subject to extras per standard classification of extras on cold-rolled strip.

EXTRAS FOR LIGHTER THAN 0.010 IN. (ANY TEMPER)

No. 1—Widths 1 in. and wider	\$1.00 per 100 lb.
3/4 in. to less than 1 in.	2.00 per 100 lb.
Narrower than 3/4 in.	3.00 per 100 lb.

No. 2—Base	
No. 3—Base	
No. 4—Base	
No. 5—Widths 1/2 in. and wider	0.40 per 100 lb.
3/4 in. to less than 1 in.	0.80 per 100 lb.
Narrower than 3/4 in.	1.20 per 100 lb.
No. 6—All widths	0.50 per 100 lb.

EXTRAS FOR FINISH

No. 2 Finish—Base	
No. 3—Finish—25c. per 100 lb.	

### Cold-Rolled Strip

STANDARD EXTRAS—SUBJECT TO CHANGE WITHOUT NOTICE

BASE PRICE—per one hundred pounds—for over 6 in. up to 23 1/8 in. inclusive x 0.161 and thicker, in Coils, HARD TEMPER, 0.25 Carbon and under

EXTRAS TO BE ADDED TO BASE PRICE:

#### COILS

THICKNESS (Inches)	Under 1/2 in. to 3/8 in. Incl. Hard Soft	Under 1 in. to 1/2 in. Incl. Hard Soft	Under 1 1/2 in. to 1 in. Incl. Hard Soft	Under 3 in. to 1 1/2 in. Incl. Hard Soft	3 in. to 6 in. Incl. Hard Soft	Over 6 in. to 9 in. Incl. Hard Soft	Over 9 in. to 12 in. Incl. Hard Soft	Over 12 in. to 23 1/8 in. Incl. Hard Soft
0.161 & heavier	\$2.00 \$2.45	\$1.35 \$1.80	\$0.85 \$1.30	\$0.65 \$0.95	\$0.25 \$0.70	Base \$0.45	Base \$0.45	Base \$0.45
0.160	1.85 2.30	1.20 1.65	0.75 1.20	0.50 0.95	0.25 0.70	\$0.10 0.55	\$0.10 0.55	\$0.10 0.55
0.099	1.45 1.90	1.05 1.50	0.70 1.15	0.50 0.95	0.40 0.85	0.20 0.65	0.20 0.65	0.20 0.65
0.068	1.55 2.00	1.15 1.60	0.80 1.25	0.55 1.00	0.50 0.95	0.30 0.75	0.30 0.75	0.30 0.75
0.049	1.70 2.25	1.30 1.85	0.95 1.50	0.70 1.25	0.65 1.20	0.45 1.00	0.45 1.00	0.45 1.00
0.039	1.70 2.25	1.30 1.85	0.95 1.50	0.70 1.25	0.65 1.20	0.60 1.15	0.60 1.15	0.60 1.15
0.034	2.10 2.80	1.60 2.30	1.35 2.05	0.90 1.60	0.85 1.55	0.75 1.45	0.75 1.45	0.75 1.45
0.031	2.30 3.00	1.80 2.50	1.55 2.25	1.10 1.80	1.05 1.75	0.80 1.50	0.90 1.60	0.95 1.65
0.028	2.40 3.10	1.90 2.60	1.65 2.35	1.20 1.90	1.15 1.85	0.90 1.60	1.10 1.80	1.15 1.85
0.025	2.60 3.30	2.10 2.80	1.85 2.55	1.40 2.10	1.35 2.05	1.25 1.95	1.50 2.20	1.60 2.30
0.022	2.75 3.45	2.25 2.95	2.00 2.70	1.55 2.25	1.50 2.20	1.50 2.20	1.85 2.55	2.45 2.90
0.019	3.60 3.60	3.20 3.20	2.95 2.95	2.50 2.50	2.35 2.35	2.60 2.60	2.85 2.85	3.05 3.45
0.016	4.15 4.15	3.75 3.75	3.50 3.50	3.05 3.05	2.90 2.90	3.15 3.15	3.50 3.50	3.75 3.75
0.014	4.80 4.80	4.40 4.40	4.15 4.15	3.80 3.80	3.80 3.80	4.20 4.20	4.40 4.40	4.45 4.45
0.012	5.45 5.45	5.05 5.05	4.80 4.80	4.45 4.45	4.25 4.25	4.45 4.45	4.80 4.80	5.05 5.05
0.011	5.70 5.70	5.30 5.30	5.05 5.05	4.70 4.70	4.50 4.50	4.70 4.70	5.05 5.05	5.30 5.30
0.010	6.15 6.15	5.75 5.75	5.50 5.50	5.15 5.15	4.95 4.95	5.15 5.15	5.50 5.50	5.75 5.75

Extras for Soft apply to all Tempers, except Full Hard.

Coils lighter than 0.010 in.—See Special List of Extras.

## Cold-Rolled Strip Steel

## CUT LENGTHS 24 IN. AND LONGER

THICKNESS (Inches)	Under ½ in. to ⅜ in. Incl.		Under 1 in. to ½ in. Incl.		Under 1½ in. to 1 in. Incl.		Under 3 in. to 1½ in. Incl.		3 in. to 6 in. Incl.		Over 6 in. to 9 in. Incl.		Over 9 in. to 12 in. Incl.		Over 12 in. to 23½ in. Incl.	
	Hard	Soft	Hard	Soft	Hard	Soft	Hard	Soft	Hard	Soft	Hard	Soft	Hard	Soft	Hard	Soft
0.161 & heavier	\$3.50	\$3.95	\$1.85	\$2.30	\$1.20	\$1.65	\$0.85	\$1.30	\$0.50	\$0.95	\$0.25	\$0.70	\$0.25	\$0.70	\$0.25	\$0.70
0.160 to 0.100	3.35	3.80	1.70	2.15	1.10	1.55	0.85	1.30	0.50	0.95	0.35	0.80	0.35	0.80	0.35	0.80
0.099 to 0.069	3.45	3.90	2.05	2.50	1.25	1.70	1.05	1.50	0.85	1.30	0.65	1.10	0.65	1.10	0.65	1.10
0.068 to 0.050	3.55	4.00	2.15	2.60	1.35	1.80	1.10	1.55	0.95	1.40	0.75	1.20	0.75	1.20	0.75	1.20
0.049 to 0.040	3.70	4.25	2.30	2.85	1.50	2.05	1.25	1.80	1.10	1.65	0.90	1.45	0.90	1.45	0.90	1.45
0.039 to 0.035	3.70	4.25	2.30	2.85	1.50	2.05	1.25	1.80	1.10	1.65	1.05	1.60	1.05	1.60	1.05	1.60
0.034 to 0.032	5.10	5.80	3.10	3.80	2.25	2.95	1.80	2.50	1.55	2.25	1.45	2.15	1.45	2.15	1.45	2.15
0.031 to 0.029	5.55	6.25	3.80	4.50	2.80	3.50	2.35	3.05	2.00	2.70	1.75	2.45	1.85	2.55	1.90	2.60
0.028 to 0.026	5.90	6.60	3.90	4.60	2.90	3.60	2.45	3.15	2.10	2.80	1.85	2.55	2.05	2.75		
0.025 to 0.023	6.60	7.30	4.60	5.30	3.45	4.15	3.00	3.70	2.55	3.25	2.45	3.15	2.70	3.40		
0.022 to 0.020	7.25	7.95	4.75	5.45	3.60	4.30	3.15	3.85	2.70	3.40	2.70	3.40	3.05	3.75		
0.019 to 0.017	9.60	9.60	7.20	7.20	6.25	6.25	5.80	5.80	4.90	4.90	5.15	5.15	5.40	5.40		
0.016 to 0.015	11.15	11.15	7.75	7.75	6.80	6.80	6.35	6.35	5.45	5.45	5.70	5.70				
0.014 to 0.013	12.80	12.80	9.65	9.65	8.65	8.65	8.30	8.30	7.30	7.30	7.70	7.70				

Extras for Soft apply to all Tempers, except Full Hard.

Extras for lengths under 24 in. on application.

NOTE: The charge for cutting to length does not relieve buyer from scrap loss, and short pieces left from cutting will be shipped and invoiced at price of long lengths. If lengths over 36 in. are ordered and no short pieces taken, add 10 per cent to net price.

## COPPER

0.25 Copper and under.....	\$0.15 per 100 lb.
Over 0.25 Copper.....	0.40 per 100 lb.

## DESCRIPTION OF TEMPER

Steel of 0.25 Carbon and under, up to and including 0.89 B Scale Rockwell to be sold at soft price, and 0.90 B Scale Rockwell and over to be sold at hard price.

## DESCRIPTION OF EDGES

- No. 1—A perfect round or square smooth edge.  
 No. 2—Natural round edge.  
 No. 3—Square, produced by slitting, not filed.  
 No. 4—Round edge rolled.  
 No. 5—Square, produced by rolling or filing after slitting.  
 No. 6—Square edge, rolled.

## DESCRIPTION OF FINISHES

- No. 2—Regular bright finish, suitable for ordinary purposes.  
 No. 3—Best bright finish.

## NOTES

Extras for width and gage tolerances closer than standard, on application.

All cold-rolled material sold in coils, in all gages and in widths up to and including 23½ in., to be sold on cold-rolled strip base and card of extras.

The specifications requiring guaranteed case carburizing qualities to meet McQuaid-Ehn tests carry an extra of 90c. per 100 lb. It is understood that this is 50 per cent higher than that carried by the hot-rolled strip manufacturers.

## EXTRAS FOR CARBON

Thickness	Over			0.81 to 1.00 Carbon Incl.
	0.25 to 0.50 Carbon Incl.	0.51 to 0.80 Carbon Incl.		
	Add per 100 lb.			
0.100 in. & thicker . . . .	\$0.90	\$2.65		\$5.00
0.050 in. to 0.099 in. . . .	1.10	2.85		5.50
0.035 in. to 0.049 in. . . .	1.35	3.10		6.00
0.031 in. to 0.034 in. . . .	1.50	3.25		6.50
0.025 in. to 0.030 in. . . .	1.70	3.45		7.00
0.020 in. to 0.024 in. . . .	2.00	3.75		7.50
0.017 in. to 0.019 in. . . .	3.00	4.75		8.50
0.015 in. to 0.016 in. . . .	3.55	5.30		10.00
0.013 in. to 0.014 in. . . .	4.20	5.95		11.50
0.12 in. . . . .	4.85	6.60		13.00
0.011 in. . . . .	5.10	6.85		14.50
0.010 in. . . . .	5.85	7.30		16.00

## EXTRAS FOR LIGHTER THAN 0.010 IN. (ANY TEMPER)

Thickness	Addition to 0.010 Extra	Thickness	Addition to 0.010 Extra
0.009 in.	\$0.50	0.004 in.	\$4.00
0.008 in.	1.00	0.0035 in.	5.00
0.007 in.	1.50	0.003 in.	6.00
0.006 in.	2.50	0.0025 in.	10.00
0.005 in.	3.50	0.002 in.	14.00
0.0045 in.	4.00		

## ADDITIONAL EXTRAS TO BE CHARGED FOR SHEARING OF NARROWER WIDTHS IN THICKNESS UNDER 0.010

Thickness	Under ½ in. to ¼ in. Incl.	Under 1 in. to ½ in. Incl.	Under 1½ in. to 1 in. Incl.
0.002 in. to 0.00275 in. .	\$8.00	\$6.00	\$4.00
0.003 in. to 0.0035 in. .	5.50	4.50	3.50
0.004 in. to 0.0045 in. .	4.50	3.50	3.00
0.005 in. ....	3.00	2.00	1.50
0.006 in. ....	2.50	1.50	1.25
0.007 in. ....	2.00	1.25	1.00
0.008 in. ....	1.50	1.10	0.85
0.009 in. ....	1.25	1.00	0.75

(Intermediate thicknesses take next lighter gage extra.)

## BOXING OR WRAPPING EXTRA

Material boxed, barrelled, crated or wrapped—25c. per 100 lb.; minimum charge, \$1.00.

## EXTRAS FOR QUANTITY

To apply on any single item of one width, thickness, finish, temper and edge for shipment at one time.

2000 lb. to 5999 lb.....	\$0.25 per 100 lb.
1000 lb. to 1999 lb.....	0.65 per 100 lb.
500 lb. to 999 lb.....	1.25 per 100 lb.
300 lb. to 499 lb.....	2.25 per 100 lb.
200 lb. to 299 lb.....	3.25 per 100 lb.
100 lb. to 199 lb.....	5.25 per 100 lb.

Orders for less than 100 lb. of a size will be accepted only at full valuation of 100 lb.

## SPECIAL NOTICES

No cold-rolled strip seconds will be shipped with prime material.

Price for cold-rolled strip seconds to be 50c. per 100 lb. less than the prime price for the same gage, size and temper.

Quoting No. 2 and No. 3 tempers on the hard extras is an unfair practice and should be eliminated. Material for flat work only is to be on the basis of No. 1 temper. Butt stock 0.050 in. and heavier to be sold on cold-rolled strip base plus the hard extra to butt manufacturers only.

Discount for uncropped coils to be eliminated.



# New Extras on Wire Products Favor Buyer

## PERIOD OF DELIVERY

Buyers must give complete shipping directions for shipments prior to the end of each calendar quarter and books will not be opened for any business during a calendar quarter earlier than 30 days prior to the calendar quarter.

Orders and contracts may now be accepted for shipment prior to September 30th. When the fourth quarter market is open, sales will be made only for shipment prior to December 31st—orders must be in hand in sufficient time to enable such delivery.

All sales and contracts must cover a definite quantity or tonnage. Preference, of course, is for completely specified orders, but commitments will be accepted for third quarter shipment at present and for fourth quarter shipment when the books for that period are opened for definite requirements, as follows:

(A) For a definite quantity.

(B) For a minimum quantity and maximum. In such cases, the contract or sale should state definite minimum and maximum quantities, for example, 200 to 250 tons. The minimum must be taken.

(C) A definite percentage of buyer's contemplated total requirements. The contract must state a certain percentage of buyer's total requirements, and also a statement of what is expected total requirement. For example—75 per cent of buyer's requirements—Estimated total requirements 300 tons."

## BUILDING AND CONSTRUCTION PROJECTS

The only exception as to the delivery date, is in the case of a buyer who has made a definite sale to a third party for a specific purpose, such as a building project. The code does not stipulate the limit of delivery in instances of this kind, of which very few occur in connection with rods and wire products.

## TERMS

All invoices are to be dated the date of shipment.

Interest will be charged on overdue accounts from the date that they fall due on the net terms until the date of payment. The rate of interest will be prescribed from time to time hereafter.

Cash discount will apply to the value of the material at the basing point on which the price is based.

## CONSIGNEE STOCKS

Consigned stocks must be cleaned up by June 30 next. No new consigned stocks or deferred payments will be considered.

## DELIVERED PRICES

Prices must be quoted f.o.b. place of delivery—not f.o.b. mill with freight allowed to the place of delivery as heretofore, nor f.o.b. the basing point. When billing, the freight is allowed.

Prices will be determined by adding to the base price for the controlling regular basing point, the all rail published tariff freight charges.

Should the place of delivery be at a basing point, switching charges from the producing plant located within the switching zone of the basing point or from the port dock, "if port dock is a basing point," will be added to base price to determine the f.o.b. delivered base price. Should there be no mill producing the product located at a same basing point, then no switching charges will be added.

Prices apply to all classes of trade, such as industrial or manufacturing consumers, jobbers and merchant trade, railroads and U.S. Government, state, county and city requirements. In all cases it is necessary to ascertain the place of delivery and quote delivered prices, f.o.b. cars at the point of delivery. Prices at Gulf and Pacific Coast basing points are to be quoted f.o.b. cars dock, and the switching charges from dock to place of delivery, in such basing points, are to be added.

## SPECIAL ALLOWANCES

Jobbers who can qualify by signing the agreement, which is being prepared, not to cut the resale on material purchased hereafter will be entitled to the special allowances mentioned below, but no such allowances will be made until the agreement is signed by the Customer.

Wire Fence, 15½ gage and heavier, \$4 net ton C.L. & L.C.L.	
" " 17 " " " " " " C.L. & L.C.L.	
" " 18 " " " " " " C.L. & L.C.L.	

## ALLOWANCE ON OTHER WIRE PRODUCTS

Carloads \$0.10 per 100 lb.

Less Carloads \$.015 per 100 lb.

No allowance will be made to jobbers where the prices show the cost separately to the jobber, such as materials that are sold on list and discount, as telephone wire.

The wire industry has determined that the minimum resale price for less carloads out of mill warehouse stocks will be the less carload price at the proper basing point, plus the carload freight rate to destination, although it is normally expected that mill warehouse prices will be at least \$2.00 to \$3.00 per ton higher. If the point of distribution is a recognized basing point, then the less than carload price at such basing point will be the minimum resale price. It is to be considered that the resale price applied to such buyers as the dealer trade, contractors and general manufacturing and industrial consumers.

If the resale is made in the form of a carload, then, of course, the regular market prices will be the governing price.

## PRICE CHANGES

Under the new ruling, the buyer need not over-buy at any time, as a minimum notice of ten days is required for any price change, during which time they normally should have no difficulty in covering their needs. This obviates the incentive for speculation. Under the list of unfair practices a consideration must be paid by the buyer for the privilege of cancelling an order or contract.

## TERMS ON WOVEN WIRE FENCING ESTABLISHED

In accordance with the long-standing custom of selling woven wire fencing to jobbers on credit terms which take into consideration postponed payment on the part of farmers, a special commercial regulation establishes such terms. It provides that "special maximum rates of discount for early payment and special maximum periods of free credit may be allowed by members of the code with respect to sales or contracts of sale of woven wire fencing in lots of 500 rods or more to or with jobbers, mail order houses, central offices of large farm bureaus and other dealers for resale, the rates of discount to apply only to the invoiced value of such fencing as follows:"

Spring Terms:—For shipments on and after Dec. 1, discount for cash: 4 per cent on or before Jan. 10; 3½ per cent on or before Feb. 10; 3 per cent on or before March 10; 2½ per cent on or before April 10; 2 per cent on or before May 10, and due net May 31.

Autumn Terms:—For shipments on and after June 1, discount for cash: 4 per cent on or before July 10; 3½ per cent on or before Aug. 10; 3 per cent on or before Sept. 10; 2½ per cent on or before Oct. 10; 2 per cent on or before Nov. 10, and due net Nov. 30.

## Wire Rods

### Base Prices on Rods at Regular Basing Points—Carloads

\$35.00 G.T. base f. o. b. Pittsburgh and Cleveland
\$36.00 G.T. base f. o. b. Chicago
\$38.00 G.T. base f. o. b. Birmingham

### Special Delivered Prices Carloads (Not Basing Points)

\$36.00 G.T. base f. o. b. Fostoria, Ohio.
\$36.00 G.T. base f. o. b. Fallston, Pa.
\$36.00 G.T. base f. o. b. Beaver Falls, Pa.
\$36.00 G.T. base f. o. b. Kent, Ohio.
\$36.00 G.T. base f. o. b. Youngstown, Ohio.
\$36.00 G.T. base f. o. b. Elyria, Ohio.
\$36.00 G.T. base f. o. b. Bedford, Ohio.
\$37.00 G.T. base f. o. b. Muncie, Ind.
\$37.00 G.T. base f. o. b. Sterling, Ill.
\$37.00 G.T. base f. o. b. Rock Falls, Ill.

# **Prices F. O. B. Dock Gulf and Pacific Coast Ports in Carloads**

\$39.00 G.T. base f. o. b. dock Galveston and Houston, Texas.
\$44.00 G.T. base f. o. b. dock San Francisco, Calif.
\$44.00 G.T. base f. o. b. dock San Pedro, Calif.
\$44.00 G.T. base f. o. b. dock Seattle, Wash.
\$44.00 G.T. base f. o. b. dock Portland, Oregon.

To make delivered prices add the all-rail freight rate to the base price at the controlling "regular" basing point.

## **Chemical Extras on Wire Rods**

		GROSS TON EXTRA
Carbon	0.30-0.37	
Manganese	0.65-0.85	
Phosphorus	0.04 Max.	\$3.00
Sulphur	0.045 "	
Carbon	0.50-0.60	
Manganese	0.90-1.20	
Phosphorus	0.04 Max.	\$7.50
Sulphur	0.05 "	
Carbon	0.10-0.20	
Manganese	1.25-1.55	\$5.50
Phosphorus	0.05-Low	
Sulphur	0.10-Min.	
Carbon	0.25-0.35	
Manganese	1.25-1.65	
Phosphorus	0.06-Max.	\$8.50
Sulphur	0.10-0.15	
Carbon	0.30-0.40	
Manganese	1.35-1.65	\$11.00
Phosphorus	0.05-Max.	
Sulphur	0.10-0.15	
Carbon	0.09-0.13	
Manganese	0.60-0.75	
Phosphorus	0.08-0.11	\$3.00
Sulphur	0.085-0.12	
Carbon	0.10-0.20	
Manganese	1.00-1.30	
Phosphorus	0.05-Max.	\$5.50
Sulphur	0.08-0.13	

## **NORMALIZED (TYPE "E")**

Carbon	0.27-0.35	
Manganese	0.70-0.90	
Phosphorus	0.04-Max.	\$8.00
Sulphur	0.05- "	
Silicon	0.07-0.17	

## **Special Extras on Wire Rods**

	PER GROSS TON
RODS—EXTRAS PER GROSS TON	
Sizes No. 5 gage to 4 in.—base in carloads.....	
L.C.L.—5 tons or more .....	\$2.00
L.C.L.—under 5 tons .....	4.00
Normalized .....	5.00
Cleaned and lime coated .....	2.50
Screw stock—0.08 per cent min. sul.—basic or Bess....	3.00
Hi-Sul. screw stock—0.20 per cent sul., min.....	5.00
Horse nail and BB telephone .....	12.00
Gas welding rods—0.06 max. carbon 0.15 mang. max....	12.00
Telegraph stock (0.30 per cent total impurities max.) and E BB .....	20.00
Acid open hearth (min. of range 0.65 or less carbon)..	15.00
Acid open hearth (min. of range over 0.65 carbon)..	25.00
Copper bearing rods—0.20 to 0.25 copper min..... no extra	
Patenting .....	7.50
Spring wire rods 1.00 to 1.30 manganese .....	10.00
Spring wire rods 0.90 to 1.20 manganese .....	5.00
Molybdenum—0.10 to 0.20 per cent .....	10.00
Molybdenum—0.21 to 0.30 per cent .....	15.00

## **Carbon Extras on Wire Rods**

When the maximum of carbon range is 0.06 .....	\$5.00
When the maximum of carbon range is 0.07 .....	4.00
When the maximum of carbon range is 0.08 .....	3.00
When the maximum of carbon range is 0.09 .....	Base
When the mean of carbon range is 0.10 to 0.19 .....	Base
When the mean of carbon range is 0.20 to 0.40 .....	\$3.00
When the mean of carbon range is 0.41 to 0.65 .....	5.00
When the mean of carbon range is 0.66 to 0.75 .....	7.50

When the mean of carbon range is 0.76 to 0.90 ..... 10.00  
When the mean of carbon range is 0.91 to 1.00 ..... 15.00  
These carbon extras apply when other elements are in normal proportions.

S. & C. Rods, lengths 2 ft. to 45 ft.

No. 5 to ½ in. inc. straightened and cut rods—25c. per 100 lb. or \$5.60 G.T.

Over ½ in. straightened and cut rods—35c. per 100 lb. or \$7.84 G.T.

## **Manufacturers Wire**

### **Price on Bright Hard Drawn Wire and Spring Wire in Carloads**

	(1000 lb or more per item)		
F.O.B. Regular Basing Points	Bright Hard Wire	Spring Wire	
Pittsburgh and Cleveland ....	\$2.10	\$3.10	Base
Anderson .....	2.15	...	Base
Chicago .....	2.15	3.15	Base
Duluth .....	2.20	...	Base
Birmingham .....	2.25	...	Base
Worcester .....	2.20	3.20	Base
Dock Houston, Texas.....	2.58	3.58	Base
Dock Galveston, Texas .....	2.58	3.58	Base
Dock New Orleans, La. ....	2.54	3.68	Base
Dock San Pedro, Calif.....	2.55	3.55	Base
Dock San Francisco, Calif...			
Dock Seattle, Wash.....			
Dock Portland, Oregon.....			

All these points are to be used as basing point.

Add the all-rail freight rate to make delivered prices at other points.

## **Special Extras on Manufacturers' Wire**

	PER 100 LB.
Base—Bright hard wire—finer than ¾ in. to No. 5 gage	
Extra clean bright wire, grease or oil drawn for tinning	\$0.15
Bright wire with extra clean surface for spot welding..	0.20
Processing 18 ga. and heavier (No. 14 & heavier).....	0.60
(No. 14½ to 18).....	0.75
Annealed wire .....	0.15
Annealed and cleaned wire, lime coated .....	0.40
Annealed and cleaned and oiled wire .....	0.50
Bright wire drawn from normalized rods .....	0.25
Bright piano tuning pin wire .....	0.50
Bright wire, cleaned and light lime coated .....	0.20
Oiling .....	0.10
Annealed box binding wire (same as annealed) .....	0.15
Bessemer screw stock, SAE 1112 and regular free cutting	
Bessemer .....	0.15
Basic O.H. screw stock, SAE 1120 (or where screw stock quality is desired) .....	0.25
Bright wire for split point rivets, extra over bright processed or annealed and cleaned basic wire .....	1.00
Bright arc welding wire 0.08 min. to 0.25 max. carbon..	0.30
Annealed arc welding wire 0.08 min. to 0.25 max. carbon	0.45
Bright gas welding wire 0.06 max. carbon .....	0.60
Molybdenum 0.10 to 0.20 per cent .....	0.50
Molybdenum 0.21 to 0.30 per cent .....	0.75
Box and basket stapling wire—over bright wire base ...	0.25
Coiled spring galv. fence wire (extra over same size of galv. wire)—	
No. 7 to 10 .....	0.10
No. 11 to 12 .....	0.20
Spoke wire, maximum carbon 0.25 or under.....	0.25
Hi-ten wire .....	0.65
Special galvanizing, all gages of wire.....	0.25
Special galvanized fencing, barbed wire and coiled spring wire .....	0.25
Minimum 0.20 per cent copper (copper bearing wire) ...	No. extra
Lime bright annealed .....	0.30
Wool wire .....	0.75

## **Extras for Quality on Galvanized Wire for Manufacture of Strand and Road Guard**

Special galvanizing .....	\$0.25 per 100 lb.
Siemens-Martin quality, tensile strength 41 to 65 tons per sq. in. ....	0.25 " " "
High strength quality, tensile strength 66 to 85 tons per sq. in. ....	1.00 " " "
Extra high strength quality, tensile strength 86 tons to 115 tons per sq. in. ....	1.85 " " "



### Extras for Special Grades of Wire

These extras apply over the price of single galvanized standard basic open-hearth quality wire, with no extra for wire having tensile strength 40 tons or less per square inch.

#### SPECIAL DRAWING—DECIMAL WIRE

	Regular No extra	(a) \$0.25 extra	(b) \$0.50 extra
½ in. and coarser, variation			
either way	0.003-in.	0.0015-in.	0.001-in.
Lighter than ½-in. to No. 14 ga.			
either way	0.002-in.	0.0015-in.	0.001-in.
Lighter than No. 14 ga. variation			
either way	0.001-in.	0.0005-in.	
If necessary, lighter than ½-in. to			
No. 14, either way		0.001-in.	0.0005-in.

#### ADDITIONAL EXTRAS

	Per. 100 lb.
Burlapping wire, in coils, No. 20 gage and coarser	\$0.15
Paper wrapping wire, in coils, No. 20 gage and coarser	0.10
Packing in barrels	0.25
No. 8 and 9 gage, galv. brace wire, 20 bundles, 5 lb. each,	
packed in 100 lb. coils	1.00
Catchweight coils, split catchweight coils 60 to 80 lb.	
each and 100-lb. coils	No extra
Even weight coils, under 100 lb.	per bdl. 0.05
No quality extra for wire for link wire.	
Bright wire, SAE	
extra per 100 lb....	\$0.15 \$0.15 \$0.25 \$0.25 \$0.35
Type - SAE.....	1020 1025 1030 1035 1045
Carbon .015-0.25	0.20-0.30 0.25-0.35 0.30-0.40 0.40-0.50
Mang. .030-0.60	0.50-0.80 0.50-0.80 0.50-0.80 0.50-0.80
Sul. .05 max.	0.05 max. 0.05 max. 0.05 max. 0.05 max.
Phos. .0045 max.	0.045 max. 0.045 max. 0.045 max. 0.045 max.

#### NO EXTRA FOR SAE 1010 AND SAE 1015

Extra per 100 lb....	\$0.25	No extra	\$0.25	\$0.25	\$0.35	\$0.35
Type .....	VP	G	E	EE	EEE	F
Carbon .030-0.37	0.08-0.15	0.27-0.35	0.35-0.40	0.40-0.45	0.08-0.15	
Mang. .065-0.85	0.30-0.45	0.70-0.90	0.70-0.90	0.70-0.90	0.80-0.99	
Sul. .05 max.	0.05 max.	0.05 max.	0.05 max.	0.05 max.	0.08-0.15	
Phos. .005 max.	0.03 max.	0.04 max.	0.03 max.	0.03 max.	0.04 max.	
Sil. .015 max.	0.07-0.15	0.07-0.15	0.07-0.15	0.07-0.15	0.10-0.20	
No extra for type GG or GGG						

### O. D. H. BRIGHT SOFT BASIC WIRE AND SELECTED LOW CARBON BASIC BRIGHT WIRE

0.06 max. carbon—for ball	
pins and heavy upsetting	\$0.30 per 100 lb. extra
Shoe nail wire—extra bright soft	0.25 per 100 lb. extra

### Telephone Wire

	DISCOUNT FROM LIST
Jobbers—C.L. and L.C.L.	15-10-10 & 5 per cent
Class A independent telephone companies, railroads, syndicate power companies, large central stations, oil companies, telegraph companies, all U.S. Government and State Departments, cities of first class	15-10 & 10 per cent

#### OTHER BUYERS

Less than 1500 lb.	List plus 25c. per 100 lb.
1500 to 10,000 lb.	Discount 15 per cent
10,000 lb. to a carload	Discount 15 & 5 per cent
Carloads or more	Discount 15-10 & 10 per cent
Galvanized bond and tie wires	
Cut to length	50c. per 100 lb. extra.
The above mentioned prices apply f.o.b. Pittsburgh, Cleveland, Waukegan, Ill., Muncie, Ind., Trenton, N. J., Sparrows Point, Md., and Worcester, Mass.	
Add the all-rail freight rate to make delivered prices to other points.	

### Cut Nails

Cut nails in straight carloads, containing no other products are quoted at \$2.75 base per keg, Pittsburgh; less than carloads or mixed carloads are priced at \$3.00 per keg base for five kegs and over, and \$3.15 for four kegs and under. A 10 per cent discount on size extras will be allowed only on straight carloads of cut nails. There will be no discount on size extras for less than carloads, or mixed carloads. Special hardened nails are \$3.50 per 100 lb. over the regular price. No discount will apply to this extra. The extra for hot-galvanized cut nails is \$2.00 per keg net, with no discount applying.

No change in the extras for cut nails has been made.

### Base and Key Prices at Regular Basing Points on Merchant Trade Wire Products Straight or Mixed Carloads—To All Classes of Trade

	Pittsburgh Cleveland	Anderson	Chicago	Duluth	Bgm.	Houston Galveston	San Francisco San Pedro Seattle Portland	New Orleans
Wire Nails	\$2.10	\$2.15	\$2.15	\$2.20	\$2.25	\$2.40	\$2.50	\$2.50 per keg
Polished Fence Staples	2.80	2.85	2.85	2.90	2.95	3.10	3.20	3.20 per 100 lb.
Galvanized Fence Staples	3.05	3.10	3.10	3.15	3.20	3.35	3.45	3.45 per 100 lb.
Galv. Poultry Net Staples	4.20	4.25	4.25	4.30	4.35	4.50	4.60	4.60 per 100 lb.
Galv. Barb Wire	2.60	2.65	2.65	2.70	2.75	2.90	3.00	3.00 per 100 lb.
6 to 9 Annealed Wire	2.25	2.30	2.30	2.35	2.40	2.55	2.80	2.65 per 100 lb.
6 to 9 Galvanized Wire	2.60	2.65	2.65	2.70	2.75	2.90	3.15	3.00 per 100 lb.
Bale Ties (key price)	45	..	46	47	48	54	56	53
Wire Fence (key price)	55	56	57	58	58	64	72	63
17 Ga. Chick Fence (key price)	116	117	118	124	120	125	133	124

Prices f.o.b. Worcester on annealed and galvanized wire—10c. per 100 lb. over the price f.o.b. Pittsburgh.

All the points mentioned above are to be considered regular basing points.

Joint carloads 10c. per 100 lb. advance. Joint cars contain material for two buyers, not less than 10 tons each.

Less carloads 30c. per 100 lb. over the straight carload price at all basing points. Pool carloads (3 or more buyers in one car) take L.C.L. price.

L.C.L. wire products included in mixed cars with sheets or any other steel commodity—10c. per 100 lb. over the price in straight or mixed carloads.

Prices at Gulf and Pacific Coast Ports as shown above are f.o.b. cars dock.

10 per cent discount will be allowed on all wire nail extras if shipped in a carload to one buyer at one destination.

Add the all-rail freight rate to make delivered prices at other points.

**CHART OF  
BASING POINTS  
for the  
IRON AND STEEL INDUSTRY  
taken from  
CODE OF FAIR COMPETITION**

	ANDERSON, IND.	BETHLEHEM, PA.	BIRDSBORO, PA.	BIRMINGHAM	BUFFALO	BURNHAM, PA.	CANTON, OHIO	CHICAGO	CLEVELAND	COATESVILLE, PA.	COLUMBIA, PA.	CREIGHTON, PA.	DANVILLE, PA.	DETROIT	DOVER, N. J.	DULUTH, MINN.	ERIE, PA.	EVANSTON, ILL.	EVERETT, MASS.	GARY, IND.	GRANITE CITY, ILL.	GULF PORTS (1)	GULF PORTS (2)
Axles (rolled or forged)				•				•															
Bale ties				•				•	•							•						•	
Bars—alloy steel, hot rolled		•			•		•	•															
Bars—cold finished: carbon and alloy					•			•	•														
Bars—concrete reinforcing				•	•			•	•													•	•
Bars—iron						•					•	•	•		•								
Bars—merchant steel				•	•			•	•													•	•
Bars—tool steel		•																					
Girder rails																							
Ingots, blooms, billets and slabs—alloy		•			•		•	•															
Ingots, blooms, billets, slabs—carbon				•	•			•	•														
Light rails: less than 60 lb. per yd.				•				•															
Mechanical tubing							•							•									
Pig iron—fdry., malleable, O. H. basic, Bess.		•	•	•	•			•	•					•		(3)	•	•	•	•	•	•	•
Pig Iron—low phosphorus			•																				
Pipe, rigid electric conduit																		•					
Pipe—std. line pipe and oil country tubular prods.																						•	•
Plates				•				•		•												•	•
Rails, 60-lb. and heavier, rail joints and angle bars take f.o.b., mill base																							
Railroad tie plates				•	•			•															
Railroad track spikes				•	•			•	•		•												
Sheet bars					•		•	•	•														
Sheets				•																			
Skelp					•			•		•													
Steel sheet piling					•			•															•
Strip steel—cold rolled									•														
Strip steel—hot rolled								•															
Structural shapes		•		(4)	•			•														•	•
Tin plate, tin mill black plate and terne plate																							
Tube rounds				•	•			•	•														
Tubes—boiler																							
Wheels, car, rolled steel								•															
Wire—drawn, except as hereinafter specified	•			•				•	•							•							•
Wire nails, staples, barbed wire and wire fencing	•			•				•	•							•						•	
Wire rods				•				•	•														
Wire—spring								•	•														
Wire—telephone									•														

(1) GULF PORTS: Mobile, Ala., New Orleans, La., Orange, Tex., Port Arthur, Tex., Beaumont, Tex., Baytown, Tex., Galveston, Tex., Houston, Tex.  
(2) GULF PORTS: New Orleans, La., Galveston, Tex., Houston, Tex. (drawn wire only).

(3) PIG IRON—Duluth, Minn. (except O. Basic).  
(4) SHAPES: Birmingham, Ala. (Standard shapes only).





# Form of Agreement Under Section 4 of Schedule E of Steel Code to be Used, if Jobber is a Corporation, and Contained in Commercial Regulation No. 1

AGREEMENT dated \_\_\_\_\_, 193\_\_\_\_, between \_\_\_\_\_, a corporation of the State of \_\_\_\_\_ (hereinafter called the Seller) and \_\_\_\_\_, a corporation of the State of \_\_\_\_\_ and having its principal place of business at \_\_\_\_\_ (hereinafter called the Buyer).

WHEREAS the Seller is a member of the Code of Fair Competition of the Iron and Steel Industry approved August 19, 1933, by the President of the United States of America, hereinafter called the Steel Code; and

WHEREAS the Buyer represents that it is (or is about to become) a jobber within the meaning of that term as used in Section 4 of Schedule E of the Steel Code and as defined in Regulations No. 1, prescribed under said Section by the Board of Directors of American Iron and Steel Institute, a New York membership corporation, on August 29, 1933, a copy of which Regulations (without the schedules thereto attached) is annexed hereto as Schedule A; and

WHEREAS the Buyer desires from time to time to purchase from the Seller for resale some of the following described products, which are products described or referred to in Section 3 of Article I of the Steel Code:

AND WHEREAS the Seller desires to sell such products to the Buyer from time to time at the respective published base prices of the Seller therefor less the appropriate deduction to jobbers specified in the published price list of the Seller as at the time in effect under the Steel Code, but only on condition that the Buyer execute this Agreement as required by the provisions of Section 4 of Schedule E of the Steel Code and of said Regulations No. 1;

NOW, THEREFORE, in consideration of the premises, the parties hereto hereby agree as follows:

1. The Buyer agrees that any product which the Buyer shall purchase from the Seller and in respect of which any such deduction shall be allowed shall be purchased by the Buyer solely for resale and that it shall not be used, processed or fabricated by or for the Buyer. For the purpose of this Agreement, the terms "processed" and "fabricated" as used in this paragraph 1 shall not include cutting to length or size, bending or, in the case of pipe, threading or coupling.

2. The Buyer agrees that it will not, without the prior approval in writing of said Board of Directors, sell any such product to any purchaser at a price or upon terms and conditions more favorable to such purchaser than the price, terms and conditions at which the Seller might then sell such product to such purchaser in conformity with the provisions of the Steel Code.

3. The Buyer agrees that it will not sell any such product in combination or conjunction with any other goods or the rendering of any service, unless (a) the price charged and collected by the Buyer for any such other goods and/or services shall be at least a fair price therefor and (b) the respective quantities of, and the respective prices charged and collected by the Buyer for, such product and such other goods and/or services shall be separately stated in the invoice covering the sale and/or the

rendering thereof in such manner that it can readily be determined therefrom whether the Buyer is strictly performing the covenant contained in the foregoing paragraph 2.

4. The Buyer agrees that, if it shall cut to length or size or bend or, in the case of pipe, thread or couple any such product, the Buyer will not, without prior approval in writing of said Board of Directors, sell the resultant product to any purchaser at a price or upon terms and conditions more favorable to such purchaser than the price, terms and conditions at which the Seller might then sell a similar product to such purchaser in conformity with the provisions of the Steel Code.

5. The Buyer agrees that it will not sell for delivery in the United States any imported product similar to any product purchased under this Agreement, unless the Buyer shall quote and sell such imported product as an imported product and unless the contract of sale, if any, and the invoice covering the sale thereof shall state plainly that it is an imported product.

6. The Buyer agrees that, if, while this Agreement shall be in effect, the Buyer shall cease to be a jobber within the meaning of that term as defined as aforesaid, the Buyer will promptly notify the Seller of that fact.

7. The Buyer agrees that, if it shall sell or use any such product in violation of any provision of this Agreement, the Buyer will pay to the Treasurer of said American Iron and Steel Institute as an individual and not as treasurer of such Institute, in trust, as provided in the Steel Code, as and for liquidated damages, the sum of Ten dollars (\$10) per ton of such product which the Buyer shall have so sold or used.

8. The Seller agrees that at any time upon request it will advise the Buyer in writing as to the price at which the Seller at that time might sell, pursuant to the provisions of the Steel Code, for delivery at a specified place any product covered by this Agreement.

9. The parties hereto agree that this Agreement shall not be in effect at any time while the Steel Code shall not be in effect.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed in their respective corporate names by their respective Presidents or one of their respective Vice-Presidents and their respective corporate seals to be hereunto affixed and to be attested by their respective Secretaries or one of their respective Assistant Secretaries, as of the day and year first above written.

by \_\_\_\_\_, [the Seller],  
President.  
Attest: \_\_\_\_\_, Secretary.  
by \_\_\_\_\_, [the Buyer],  
President.  
Attest: \_\_\_\_\_, Secretary.

[NOTE: A copy of Regulations No. 1, without Schedules 1, 2 and 3, must be annexed to this form of agreement when it is executed.]



## Lamont Resigns As Institute Head; Administrative Committee In Charge

**C**OL. Robert P. Lamont, who has served as president of the American Iron and Steel Institute since his leaving President Hoover's cabinet in August, 1932, has tendered his resignation, which was accepted by the institute's directors on Sept. 20. The position is not expected to be filled immediately and the policies of the organization will be under the direction of Charles M. Schwab, chairman of the board, and the general administrative committee which was appointed recently to assume general supervision of the working of the code. This committee, of which W. A. Irvin, president, United States Steel Corp., is chairman, consists also of Eugene G. Grace, president, Bethlehem Steel Corp.; Tom M. Girdler, president and chairman, Republic Steel Corp.; E. T. Weir, chairman, National Steel Corp.; L. E. Block, chairman, Inland Steel Co.; Hugh Morrow, president, Sloss-Sheffield Steel & Iron Co., and W. J. Filbert, vice-chairman, United States Steel Corp.

Colonel Lamont's resignation was not entirely unexpected in the industry, in view of the greatly changed character of the Institute's activities under the iron and steel code. As summed up in his letter to Mr. Schwab which accompanied his formal resignation, Colonel Lamont stated that "the opportunity for constructive, forward-looking studies and plans for the industry as a whole that seemed possible a year ago must give way to the present practical immediate demands which can best be met by men familiar with the vast details of the various branches of the industry. I can be of little help in this work."

While never actively identified with



COL. R. P. LAMONT

the manufacture of finished iron and steel products, Colonel Lamont brought to the industry a wide and varied experience in the steel castings and railroad materials field. As president of American Steel Foundries, Chicago, he was for many years active in the metal working industry, and during the War, as head of the Procurement Division of the Ordnance Department, he gained a wide acquaintance in the steel industry. He entered the Hoover cabinet on March 4, 1929, as Secretary of Commerce, relinquishing that position on Aug. 3, 1932.

with revolutionary operating characteristics. Companies associated in the development of the car are the Pullman corporation; Westinghouse Electric & Mfg. Co.; Aluminum Co. of America; and the Westinghouse Air Brake Co. It is expected that the car will be placed in service early in 1934.

## Aluminum Cars for New York Transit System

Contracts have been placed with the Pullman Car & Mfg. Corp., Chicago, for an aluminum multiple-section streamlined car for the New York Rapid Transit Corp., of the B.-M.T. System. The car is a five-section unit, 170 ft. long, mounted on six trucks. It will weigh 140,000 lb., or about half that of the conventional "L" train.

Approximately 43,000 lb. of aluminum will enter into the construction of the car. It will save 80,000 lb., almost twice its own weight. Use of aluminum is said also to increase the car's safety factor and make possible a smoothness of outline in streamlining. Newly developed electrical equipment is said to provide the car

## Scrap Institute Forms Non-Ferrous Committee

**A** NON-FERROUS scrap metal division of the Institute of Scrap Iron and Steel is being formed to protect the interests of scrap iron dealers who also have scrap metal departments. The division will be known as the scrap metal (non-ferrous) committee of the institute, and is being formed in accordance with a resolu-

tion adopted at the annual convention of the institute. It will consist only of members of the scrap iron institute who also handle scrap metals and who do not belong to any other organization. The general committee will likely comprise several hundred members and a smaller executive committee will be formed later to consider the non-ferrous problems of those members who are interested in this subject. Ike W. Wilkoff, of the Wilkoff Co., Youngstown, is general chairman of the committee.

## Sheet Bar Freight Rates from Cleveland Reduced

**R**EDUCED railroad freight rates on sheet bars for shipment from Cleveland to Pittsburgh, Wheeling and various other consuming points, 11 in all, in Pennsylvania, Ohio, West Virginia and Kentucky, have been announced by railroads in the Central Freight Association territory, to become effective Oct. 1. Instead of applying the billet rate for shipments to these points as heretofore the rule of making the sheet bar rate 87 per cent. of the billet rate will be applied. The rate on sheet bars to all 11 points will be 2.52 per 100 lb. The present rate to Pittsburgh exclusive of surcharge is \$2.90. A rate of \$2.62 on steel slabs for shipment from Cleveland to Detroit has been established by the same method.

## New England Metal Working Plants Active

**A** DECIDED pickup in the activities of metal working industries is reported in various parts of New England, while in others, plant operations have been handicapped by labor troubles. More labor trouble has been experienced in and about Boston than elsewhere, but in virtually all cases has been corrected through court action. So far, labor trouble has not originated with organized labor.

The pickup in the Springfield, Mass., district has been quite pronounced, the local branch of the National Metal Trades Association having had urgent calls for labor on Jones & Lamson turret lathes, Potter & Johnson automatic screw machines, Cleveland automatic screw machines, grinders of the Bryant type, centerless grinders and paper machine tenders.

Two 600-hp. reel motors, auxiliary motors and control equipment for the new cold strip mill of the Youngstown Sheet & Tube Co., Indiana Harbor, Ind., have been purchased from the Westinghouse Electric & Mfg. Co., East Pittsburgh.



## THE NEWS OF THIS WEEK

### British Pig Iron Sales Expand Tin Plate Inquiry Broadens

LONDON, ENGLAND, Sept. 19 (*By Cable*).—British pig iron demand is expanding and Cleveland iron is likely to become scarce unless output is increased. Hematite stocks are still heavy, however, although business is improving.

Steelworks are busier this week, mostly on domestic orders. Tin plates are quiet from the production stand-

point, but inquiries are broadening and works are generally well placed and are maintaining prices.

Exports of pig iron from the United Kingdom for August totaled nine thousand tons, of which 80 tons were shipped to the United States. Total exports of steel and iron were 150,000 tons.

Continental steel business is quiet. The recent raw steel cartel meeting was lacking in tangible results. It is believed that Belgian steel merchants have agreed to the cartel's terms, but French, German and Luxemburg merchants have not yet consented to them.

International Wire Export Co. is meeting Sept. 27 to discuss especially the serious menace of Japanese competition in India and the Far East. Hungary is also selling rails to India at low prices.

Czechoslovakia will destroy or modernize 11 of 27 blast furnaces. Calcutta will call for bids for a bridge to replace the existing Howrah bridge. The cost will be approximately £2,000,000.

British and Continental gold prices are unchanged from last week.

At the beginning of 1930, seven of nine specified industries were at a production level above that of 1923 to 1925. Subsequently the most conspicuous falling off was in the iron and steel industry, which in March, 1933, produced only 22 per cent of its 1923-1925 output, and the automobile industry, which in October, 1932, produced only 16 per cent and in March, 1933, only 27 per cent of its 1923-1925 output. In July, 1933, however, the iron and steel industry had risen to 100 per cent, and the automobile industry, to 70 per cent of the 1923-1925 average output.

### Second Advance in Steel Plant Wages

ANOTHER wage advance has been made by subsidiaries of the United States Steel Corp. and leading independents effective Sept. 15. This advance is a part of the program to increase rates to compensate for the reduction in working hours to a 40-hr. week under the iron and steel code. The first step was taken July 15 when a flat 15 per cent advance was made. The new wage readjustments range up to an increase of 12½ per cent.

Work schedules are now being rearranged with a view of having all employees on an 8-hr. day by Nov. 1 under the provisions of the code. Wages of men who have been working 10 hr. have been advanced 12½ per cent giving the same pay for 8 hr. that the men formerly received for 9 hrs. This advance will apply to employees of rolling mills and other departments that have been on a 10-hr. day. This and the former advance of 15 per cent more than compensate for the reduction in working hours.

Employees in departments on continuous operations where the 8-hr. day with three turns prevail have been given a further advance of about five per cent. Common labor in the districts having a 40c. an hr. minimum rate under the code is increased to 42½c. an hr., or over six per cent, and

#### British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export .....	\$9		
Billets, open hrth. \$5		to \$5 12s.	6d.
Black sheets, Japanese specifications .....	\$11		
Tin plate, per base box .....	16s.	6d. to	17s.
Steel bars, open-hearth .....	\$7 17½s.	to \$8 7½s.	
Beams, open-hrth. \$7 7½s.		to \$7 17½s.	
Channels, open-hearth .....	\$7 12½s.	to \$8 2½s.	
Angles, open-hearth .....	\$7 7½s.	to \$7 17½s.	
Black sheets, No. 24 gage .....	\$9		
Galvanized sheets, No. 24 gage .....	\$11	to \$11 10s.	

#### Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold \$ at \$4.86			
*Ingots .....	\$2 5s.		
*Billets, Thomas. \$2 7s.			
Wire rods, No. 5 B.W.G. ....	\$4 10s.		
Black sheets, No. 31 gage, Japanese .....	\$11 5s.		
*Steel bars, merchant .....	\$3		
*Sheet bars .....	\$2 8s.		
Plates, ¼ in. and up .....	\$3 18s.	6d.	
*Plates, ½ in. and 5 mm. ....	\$4 1s.		
*Sheets, ½ in. ....	\$4 6s.		
*Ship plates .....	\$4 10s.		
*Beams, Thomas. \$2 16s.		6d.	
*Angles (basis) ..	\$3		
Hoops and strip steel over 6-in. base .....	\$3 15s.		
Wire, plain, No. 8. \$5 7s.		6d.	
Wire nails .....	\$5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G. \$8 15s.			

\*Prices as established by European Raw Steel Cartel.

### Manufacturing Output Nears 1923-25 Level

MANUFACTURING production in the United States in the first seven months of 1933 averaged 16 per cent higher than in 1932, according to an analysis of Federal Reserve Board indexes by the National Industrial Conference Board. In mining production averaged 12.5 per cent higher than in the preceding year. The low point in manufacturing, according to the board, was reached in March, 1933. A recovery of 77 per cent in the four months that followed brought production very close to the average of the 3-year period 1923 to 1925.



a corresponding increase is made in districts having a lower minimum common labor rate. Salaried employees are not advanced.

## Plan Hearing on Rules for Shipbuilders

THE code committee of the shipbuilding and ship repairing industry has drawn up proposed administrative rules and regulations, copies of which are available at the office of the National Council of American Shipbuilders, 11 Broadway, New York. A hearing on these proposed administrative rules and regulations will be conducted by the committee at 10:30 a. m., Sept. 26, in the Chinese room of the Mayflower Hotel, Washington. An opportunity to be heard, either in person or by duly appointed representative and either by appearance or by sending a written or telegraphic statement, will be given to persons or groups who can show a substantial interest in the effect of any provision of the proposed rules and regulations.

The code committee formed in accordance with paragraph 8 of the code, consists of William H. Davis, representing Gen. Hugh S. Johnson, administrator of the National Recovery Administration; Capt. Henry Williams, representing the Secretary of the Navy; Joseph McDonagh, representing labor; Robert L. Hague, representing consumers; and the following members elected by the industry: H. G. Smith, chairman; Joseph Haag, Jr., president, Todd Dry Dock, Engineering & Repair Corp.; S. W. Wakeman, vice-president, Bethlehem Shipbuilding Corp., Ltd.; Roger Williams, vice-president, Newport News Shipbuilding & Dry Dock Co.; Robert Haig, vice-president, Sun Shipbuilding & Dry Dock Co., and W. H. Gerhauser, president, Great Lakes Shipbuilding & Repair Assn.

## Olds and Chrysler Let Equipment Contracts

THE Olds Motor Works, Lansing, Mich., is reported to have placed an order totaling close to \$100,000 with a prominent machine tool builder for the modernization of its cylinder block line for its 1934 car. Chrysler Corp. has purchased machine tools for installation at its Plymouth division, its expenditures for this purpose amounting to about \$100,000. A low-price car manufacturer, who has been an active buyer of equipment for a number of weeks, made further commitments the past week. The number of inquiries before the machine tool trade at Detroit point to purchases in considerable volume in the next 30 days.

## Steel and Automotive Officials Fraternize at Detroit Outing

THE Iron and Steel Club of Detroit held one of the most successful outings in its history on Sept. 9 at the Indianwood Club near Orion, Mich., when the members had as their guests purchasing officials from companies in or allied with the automobile industry. About 150 members and guests participated in the golf tournament and attended the dinner which followed. William S. Knudsen, president of the Chevrolet Motor Co., made an informal after-dinner talk, and Abner E. Larned, head of NRA activities at Detroit, discussed the recovery program. Frank R. Frost, president of the Superior Steel Corp., also addressed the meeting. Henry A. Roemer, president of the Sharon Steel Hoop Co., acted as toastmaster. At the end of the program a number of prizes in connection with the golf tournament were awarded.

In addition to steel buyers, the club members had as their guests many steel company executives including W. H. Davey, president, Canton Tin Plate Co.; R. B. Barnett, assistant sales manager, Union Drawn Steel Co.; E. H. Clark, chairman of the board, Newton Steel Co.; A. F. Dohn,

vice-president and sales manager, Ludlum Steel Co.; B. E. Kibbee, vice-president, Sharon Steel Hoop Co.; C. V. Lally, manager of sales, Pittsburgh Steel Co.; W. J. McCordle, general sales manager, Allegheny Steel Co.; A. M. Letellier, vice-president, Cuyahoga Steel & Wire Co.; R. C. Todd, assistant vice-president, American Rolling Mill Co.; L. N. Douglas, sales manager, Greer Steel Co.; W. A. Givens, general superintendent, Allegheny Steel Co.; and J. L. Harrison, manager continuous mill sales division, Wheeling Steel Corp.

The tournament was in charge of the following club members: A. J. Bopp, Bopp Steel Corp., chairman house committee; Charles A. Poxson, Newton Steel Co., chairman attendance and publicity committee; W. J. Clucas, Columbia Steel & Shafting Co., general chairman outing committee; H. M. Arbuthnot, Allegheny Steel Co., chairman entertainment committee; E. M. Vehmyer, Joseph T. Ryerson & Son, Inc., chairman golf committee; H. B. Miller, Wheeling Steel Corp., chairman prize committee; and A. A. Keally, Sharon Steel Hoop Co., chairman reception committee.

▲ ▲ ▲  
PHOTOGRAPHED  
on the steps of the  
Indianwood Club near  
Orion, Mich., at the  
outing of the Iron and  
Steel Club of Detroit  
(left to right):

William S. Knudsen, president, Chevrolet Motor Co.; W. J. Clucas, Detroit district sales manager, Columbia Steel & Shafting Co.; A. J. Bopp, president, Bopp Steel Corp.; Henry A. Roemer, president, Sharon Steel Hoop Co.; and Abner E. Larned, chairman of NRA activities at Detroit.  
▼ ▼ ▼



# Protecting Pipes Against Soil Corrosion

THE case of the protection of ferrous pipes against soil action was brought up to date by K. H. Logan, United States Bureau of Standards, Washington, in a paper contributed to the international session of corrosion conducted by the Electrochemical Society at Chicago, Sept. 7.

Although the annual loss due to underground corrosion is estimated to be \$100,000,000 for the United States alone, other factors such as obsolescence which limit the useful life of a pipe line must be taken into consideration. Then again, if a pipe wall is sufficiently thick, it will not be punctured within the economic life of the line. And, as a rule, only a small proportion of the total cost of a pipe line can be spent economically for protection against corrosion.

These general conditions have not

mitigated against studies of the corrosion problem, including tests of copper-bearing steels and iron-chromium alloys buried in different varieties of soil over a period of years. In most soils the rate of pitting is greatest for the first year or two.

As regards metallic coatings, the galvanized pipe appears to be superior to the lead-coated pipe. "In neutral and nearly neutral soils a 2-oz. zinc coating should not show signs of failing for at least eight years and the protection afforded would probably extend over a considerably longer period. In highly acid or alkali soils definite pitting of the base metal may be expected to begin within six years."

A cement mortar coating, Mr. Logan mentions, has been developed within the last two years which re-

quires much less material and is more easily and economically applied than former coatings of the kind. He considers the protection provided by the mortar as largely mechanical, "although the alkali in the cement may precipitate to some extent the first corrosion products formed and thus seal the pores and hair cracks in the original coating. . . . The effectiveness of a cement mortar probably depends on the density of the mortar and local moisture conditions. Special precautions must be taken if the coating is to be exposed to soil high in sulphates."

Coal tar coatings are believed to be somewhat more nearly moisture proof than those with petroleum asphalt bases. On the other hand to the asphalts are ascribed characteristics which tend to make them superior to coal tar for pipe coating construction. "The protective value of bituminous coatings with respect to soil corrosion seems to lie in their ability to maintain uniform oxygen and moisture distribution at the pipe surface, thus minimizing the number and potentials of the concentration cells."

## Last Minute Sales Leads

(Received too late for classification in our Plant Expansion Section)

**Little Pepper Distillery, Inc.**, Teeston Road, Lexington, Ky., has plans for new plant, with power house, machine shop and other mechanical structures. Cost about \$135,000 of which \$100,000 will be expended for equipment. Leo L. Oberwarth & Sons, Frankfort, Ky., are architects.

**Air Transport Co., Ltd.**, Glendale, Cal., plans rebuilding portion of airplane repair works and salvage plant, near municipal Grand Central Air Terminal, recently destroyed by fire. Loss over \$75,000 with equipment.

**Bureau of Yards and Docks**, Navy Department, Washington, has secured following appropriations for new buildings, extensions and improvements at naval base, Pearl Harbor, Honolulu, T. H., and will soon take bids: Addition to foundry, \$125,000 with equipment; improvements in industrial plant, \$40,000; improvements in fuel oil system, \$230,000; new cranes for repair basin, \$380,000; extensions and improvements in electric, water, sewer and railroad system, \$350,000; fire protection system, \$80,000.

**Board of Water Commissioners**, Watertown, Wis., asks bids until Oct. 4 for one centrifugal pumping unit with accessories, capacity 1200 gal. per min., and for one 100-hp. gasoline engine. E. B. Parsons, 419 Washington Street, is engineer.

**Commercial Malt Co.**, 1838 Dime Bank Building, Detroit, recently organized, plans new multi-story plant for production of brewers' and distillers' malt at Dix-Vernor Highway and River Rouge, including power house, machine shop, grain elevator units and other structures. Cost about \$500,000 with equipment.

**Pershing Square Garage Co.**, 1275 Subway Terminal Building, Los Angeles, is arranging fund of \$2,000,000 for new three-story automobile service, repair and garage building, including machine shops, pumping systems, automatic lifts and other equipment. S. C. Lee, 2404 West Seventh Street, is architect.

**General Purchasing Officer**, Panama Canal, Washington, asks bids until Sept. 29 for four dredge dipper manganese steel lips, one 8-in. blade cutter head, nine 60-gal. capacity oil tanks, 20,000 lb. steel track spikes, 5000 lb.

steel track bolts, cast iron water pipe fittings, etc. (Schedule 2902.)

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Sept. 27 for air compressors for Philadelphia Navy Yard (Specifications 7335.)

**City Council**, Menominee, Mich., is arranging financing in amount of \$650,000, fund to be used for erection of a municipal electric light and power plant.

**Emelio Giometti**, head of Fresno-Madera Ice Co. and Yosemite Ice Cream Co., Fresno, Cal., has organized brewing company to build new plant at Blackstone and Hedges Avenues, where site has been acquired. Cost about \$160,000 with equipment.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Sept. 29 for 10 electric-driven winches (Schedule 716) for Boston, Philadelphia, Norfolk, Mare Island and Puget Sound Navy Yards; until Sept. 26, 16,500 lb. copper and 6000 lb. naval brass (Schedule 695) for Eastern and Western and Mare Island yards; 57,600 lb. sheet lead (Schedule 694) for Mare Island Yard; until Oct. 3, 49 steel railway cars (Schedule 726) for Charleston, Norfolk, Washington, Puget Sound, Mare Island, Philadelphia and other yards.

**Bureau of Ordnance**, Navy Department, Washington, asks bids until Sept. 26 for 63 6-in. gun barrel forgings.

**Kay Battery Co.**, Chicago, is transferring factory and offices to Beloit, Wis., occupying plant of former Beloit Burr Co. at 1026 Clary Street. Company manufactures storage batteries, battery chargers and electric welding, transformer and motor generating sets.

**Fluor Brothers & Smith Co.**, Oshkosh, Wis., is successful bidder for new sewage plant at Fort Atkinson, Wis., at \$38,100. Including equipment, project will cost \$65,000. Robert Cramer, 647 West Virginia Street, Milwaukee, is consulting engineer.

**Brillion Iron Works**, Brillion, Wis., is being reorganized following purchase of assets by bondholders at receiver's sale, and plans early resumption of production of soil pulverizers and gray iron castings.

**Georg von Giesche Erben**, G.m.b.H., Breslau, Germany, operating zinc and other mining properties, is planning construction of new electrolytic zinc refining plant in vicinity of Madgeburg, Germany, consisting of number of units for large capacity. Cost over \$800,000 with equipment. Approval of German Government has been secured for project.

**Municipal Council**, Johannesburg, South Africa, plans expansion in electric generating plants and power substations, with installation of new 15,000 kw. and 10,000 kw. turbo-generators with exciters and auxiliaries, boilers, stokers and other equipment. Early call for bids planned. Cost over \$2,500,000 with machinery.

**E. I. duPont de Nemours & Co.**, duPont Building, Wilmington, Del., is considering establishment of large branch plant in vicinity of Prague, Czechoslovakia, for manufacture of industrial chemicals. Negotiations are being concluded with Czechoslovakian Government for approval of project.

**Federal District Government**, Mexico, D.F., is arranging bond issue of 25,000,000 pesos (about \$7,065,000) for extensions and improvements in waterworks and supply system, including installation of pumping machinery and auxiliary equipment, pipe lines, etc. Program will be carried out over 24-month period and considerable equipment will be purchased in United States.

**Manchuria Oil Co.**, Dairen, Manchuria, is planning construction of new oil refining plant in Chang-chun district, with large storage and distribution units. South Manchuria Railway Co., same place, has secured Government permission to invest 1,700,000 yen (about \$442,000) in new company, while Government of Manchoukuo will be interested to amount of 1,300,000 yen (about \$338,000) and private interests, 2,000,000 yen (about \$520,000).

**Ministry of Interior**, Government of China, Peiping, China, is planning extensive public works program to be carried out over period of months at estimated cost of \$50,000,000, including construction of railroad from point on North Coast to Province of Sinkiang, bordering on Soviet Russian frontier, with locomotive and car repair shops and other mechanical structures; irrigation system from Tarim River to points in province noted, with installation of power and pumping plants, electric transmission lines and other operating facilities.



## General Motors Sales Overseas Recovering

GENERAL MOTORS sales in overseas markets during August totaled 11,292 units, compared with 11,908 units in August, 1930. The August, 1933, total was 36 per cent higher than the total for August, 1931, and 91 per cent over August, 1932. Retail sales of General Motors products in all overseas markets are more than keeping pace with wholesale deliveries, and the corporation reports that Great Britain and the Union of South Africa, in particular, are experiencing the greatest wave of renewed consumer buying in the history of these markets.

## To Observe "Steel Day" at Century of Progress

THE iron and steel industry will celebrate "Steel Day" at the Century of Progress in Chicago on Oct. 21. The following committee on arrangements has been appointed by the American Iron and Steel Institute: G. G. Thorp, president, Illinois Steel Co., Chicago; L. E. Block, chairman, Inland Steel Co., Chicago; T. M. Girdler, president and chairman, Republic Steel Corp., Youngstown; Frank Purnell, president, Youngstown Sheet & Tube Co., Youngstown; Alexander Legge, president, International Harvester Co., Chicago; C. D. Caldwell, president, Interlake Iron Corp., Chicago; Ralph H. Norton, president, Acme Steel Co., Chicago, and George E. Scott, president, American Steel Foundries, Chicago.

The proposal to hold the fall meeting of the American Iron and Steel Institute in Chicago on the preceding day has apparently been abandoned, and it is now likely that the meeting will be omitted as was the case in 1932.

## British Steel Exports Up—German Lower

EXPORTS of iron and steel products from the British Isles in July, amounting to 156,143 gross tons, exceeded those of June by 2356 tons, according to reports to the Department of Commerce from its London office. Tin plate shipments increased 2539 tons, galvanized sheets 1722 tons, and wrought pipe 2274 tons.

Imports, at 63,434 tons, were 5585 tons under June. Imports of 6571 tons of ingots and 1558 tons of pig iron were insufficient to offset the downward tendency of the 12 other items included in the total.

Continued improvement in Germany's iron and steel industry is revealed in a similar report from the

American Consulate-General at Cologne. The industry is now occupied at about 40 per cent of capacity, which is, to a greater extent than in previous years, attributable to home consumption. Export markets are still at an extremely low level with few signs of immediate improvement. Unemployment in the iron and steel industry in Germany, according to the report, has shown a sharp decrease in recent months and a generally improved demand on the part of nearly all branches of the domestic trade has been accompanied by the replacement of stocks and replenishing of warehouse.

German production of iron and steel products in the first half of 1933 amounted to 8,486,471 metric tons as compared with 7,402,456 tons in the corresponding period of last year. Exports in the 1933 period amounted to 670,480 metric tons, valued at 115,798,000 marks, as against 854,028 tons valued at 135,689,000 marks in 1932.

## Foreign Trade Groups Are Banded Together

IN accordance with the furtherance of coordinated effort among foreign traders and the curtailment of duplicated services, the National Federation of Foreign Trade Associations has been formed and will begin active existence on Oct. 1. The Federation is not a new foreign trade body, but a tying together of already existing organizations which will utilize more intensively the physical facilities of the National Foreign Trade Council. Reginald F. Chutter, chairman of the foreign trade committee of the Philadelphia Chamber of Commerce, export manager of Sharp & Dohme, is temporary chairman.

## Construction Contracts Increase 28 Per Cent

AUGUST construction contracts in the United States totaled \$106,131,100, according to the F. W. Dodge Corp., representing a gain of about 28 per cent over July and being the largest monthly total this year. For the first eight months contracts totaled \$620,937,600 as against \$929,836,500 for the corresponding 1932 period. The gain over July was entirely due to increased activity in public work and public utilities. For the former the August total was more than twice the July figure, and for the latter August awards were almost five times as large.

It is estimated that contracts of all descriptions during the final four months of 1933 will probably range between 400 and 450 million dollars for the 37 Eastern States. Of this indicated total more than 60 per cent appears as the probable volume of publicly-financed work.

## Rustless Iron Acquires Additional Patents

THE Rustless Iron & Steel Corp., New York, through its subsidiary, Rustless Iron Corp. of America, has acquired additional important patent rights which have been issued by the Patent Office to members of the research staff of Alloy Research Corp., an affiliated concern and assigned to the former corporation. One of the inventions covers the manufacture of rustless iron or stainless steel from scrap materials of similar composition, as a considerable volume of scrap is available in all stainless steel producing and fabricating plants. The successful utilization of this scrap is of economic importance. The Patent Office has granted 17 distinct claims, including several modifications, for this process.

The other patent just issued covers the preparation of raw materials used in the production of alloys, as rustless iron and stainless steel, before charging into an electric furnace. Thirteen claims have been granted.

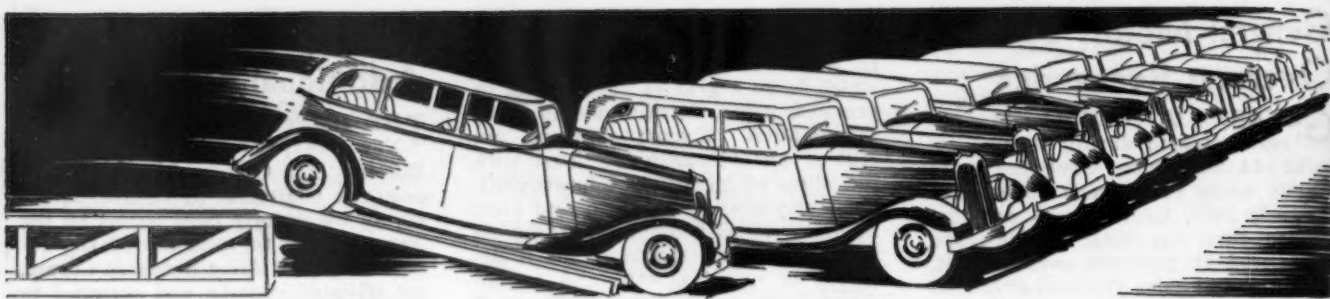
## Bids Identical On Navy Steel—Lots Are Drawn

WITH all prices identical under the NRA code, the Navy Department is drawing lots for the distribution of steel for 10 destroyers to be built at navy yards. These vessels will require about 6000 tons of plates, 2700 tons of shapes and 300 tons of steel bars. Bids for all this steel have been opened. Delay in making awards has been caused by many riders and other new provisions in the bids arising from the code requirements. The prices, however, are all the same, and, other things being equal, have made it necessary to decide upon awards by drawing lots.

The first awards decided by this method covered 1350 tons of plain black plates. They were awarded as follows: Lukens Steel Co., 480 tons; Bethlehem Steel Co., 320 tons; Jones & Laughlin Steel Corp., 240 tons; Carnegie Steel Co., 250 tons, and Central Iron & Steel Co., 60 tons.

## Peru Fixes Import Surtax on Machinery

WASHINGTON, Sept. 19.—A recently promulgated Peruvian law, seeking to promote the construction of public works in the Department of Piura, fixes an import surtax of one-fifth of the duty on machinery in that department, says a cable from Acting Commercial Attache Julian D. Smith, Lima. The law specifically exempts from this surtax, tin plate, shooks for box assembly and foodstuffs in general.



▲ ▲ ▲ THIS WEEK ON THE ASSEMBLY LINE ▲ ▲ ▲

## October Output Put at 150,000 Units; Steel Users Protest Price Set-Up

DETROIT, Sept. 19.

**A**UTOMOBILE production this month has been sustained at a sufficiently high level to fulfill the promise that assemblies will be about 185,000 units, as against 86,492 units in September of last year. Moreover, a preliminary survey of October schedules shows that output the coming month is likely to be at least 150,000 units, or approximately three times the number turned out in October, 1932. Chrysler, with a goal of 55,000 cars this month, is planning on maintaining its current rate of operations through October, while Ford probably will hold close to its present pace. In fact, Ford has announced that it is taking on 5000 more men at Dearborn, raising total employment at the Rouge plant to 50,000. The major recession in activities next month will occur in General Motors' divisions, which will be cleaning up production of 1933 models and will be in the midst of their tooling up programs for next year's cars. Chevrolet is understood to be contemplating a drop from 55,000 units this month to about 37,000 in October. It probably will not complete assemblies of its present line until in November, when the final 5000 to 10,000 cars will be shipped from its assembly plants.

### Steel Releases Continue

Motor car companies still are hastening to get under cover at old prices before the end of the third quarter with the result that releases for all steel products, particularly sheets and strip steel, continue relatively heavy. Purchases have not been confined to steel and other raw materials, but have extended to parts. It is said that in some cases automobile makers have gone so far as to finance the buying of steel by parts manufacturers so that the latter can take advantage of third quarter steel contracts and pass along

the savings. These parts releases anticipate requirements over the remainder of the year and perhaps for even a longer period. One of the larger automobile companies, which has been stocking huge quantities of steel against higher prices, was in the market the past week for close to 50,000 tons of full-finished sheets with the stipulation that mills guarantee the material against deterioration while awaiting fabrication over two to three months. When it found that no steel company would make such a guarantee for longer than two weeks from the time of delivery, it withdrew the inquiry. In another instance a prominent automobile maker, which long has insisted that each steel purchase constituted a separate transaction, tried to add to a previous order, but discovered that it was quoted the new code prices. Steel mills, adopting the methods used by this company, interpreted the inquiry in the light of a fresh purchase.

### Steel Buyers Seek Arbitrary Delivered Prices at Detroit

The mere fact that arbitrary rules regarding prices have been set up by the steel industry is no indication that automotive consumers of steel are ready to accept them without a hard battle. It is becoming increasingly evident that the storm clouds which have been gathering ever since some of the provisions of the steel code became known are about to burst. Steel users point out that there is no justification for depriving them of lower delivered prices obtained from water and truck shipments and particularly no reason exists for mills nearby to charge a delivered price consisting of a Pittsburgh base price plus full rail rate from Pittsburgh to Detroit or other southern Michigan cities. They go so far as to say that if the steel industry wishes to hold to its arbitrary stand, they will give all of their ton-

nage to mills at distant points located so that they are compelled to ship by rail. In this way they will carry out the wishes of the Roosevelt Administration to create more employment. Justifying their position, they declare that most of the rise in steel operations since early spring was due to automotive requirements and that furnishing as much tonnage as they do they are entitled to concessions. They assert that the local steel mill has the capacity to supply them 20 per cent of their needs in the products which it makes and that it is substantially in agreement with their position. They are said to advocate establishment of an arbitrary delivered price at Detroit based on the Pittsburgh price plus 15c. to 20c. per 100 lb., compared with the all-rail rate of 28½c. from Pittsburgh, on steel bars, sheets and strip steel. The delivered price at other Michigan centers, such as Flint and Lansing, would be slightly higher. This arrangement would be similar to that which has existed for the past year, until abolished by the steel code, on steel bars which have been sold at 1.80c. delivered Detroit and 1.85c. delivered at other southern Michigan points. Automobile companies are bringing pressure to bear to secure adoption of this plan and it would not be surprising if they achieved their purpose. They are generally in sympathy with the new price structure, recognizing the fact that steel mills must get more money for their products if the industry is to operate at a profit, but they contend that in eliminating the privilege of using water and truck transportation to achieve economies, the steel people have overstepped themselves.

### Chevrolet Buys Steel for New Car

Chevrolet has given steel releases against third quarter contracts covering its first production run on 1934 models, estimated at 50,000 units. Its



plants at Detroit and Flint, which are usually about 30 days ahead of assembly operations, will go down for a week or two during October for tooling-up purposes. The shutdown, however, will be as short as possible.

The fact that Ford is preparing to stage an exhibit of 30 years of progress at Convention Hall in Detroit the final week in October and that employment is being increased at Dearborn has led to a discussion of whether the small model 44 V-eight will be introduced at that time. Although no official information is available, it is known that few releases have been given for materials and parts for this car. It is well known that Mr. Ford is far from reconciled to his present position in the industry, with Chevrolet far in the lead and Plymouth close on his heels, and that he is preparing to spend tens of millions of dollars to regain supremacy in the low-price field.

#### Detroit Notes

Cold-rolled strip steel is losing ground to sheets for fender purposes. It is reported that both rear fenders for the new Chevrolet will be made from one sheet in a single operation

and split after fabrication. This has been the practice the past year in connection with Pontiac rear fenders. The front fender for the 1934 Chevrolet, including the skirt, will be stamped from a single sheet 48 in. wide, requiring a draw 18 in. deep. The past year the skirt has been welded onto the fender. . . . Up to Sept. 11 Packard had received orders for 2680 of its new cars. It will turn out 1500 cars this month and its tentative schedule for the remainder of the year calls for 5000 cars. Its dealers' stocks today are 1160 cars, compared with 4075 a year ago. . . . One of the leading manufacturers may adopt an automatic clutch as standard equipment on its 1934 cars. . . . Ford is reported to have bought the past week about 3000 tons of spring steel billets to be rolled on its 10-in. merchant rod mill at Dearborn. . . . Whether increased steel prices will act as a spur to Mr. Ford to resume operations of his steel plant is an active topic of conversation in local steel circles. Even at the higher prices, it is believed that he can buy his steel outside cheaper than he can make it at Rouge.

delphia territory for several years, has been appointed district sales manager of the Eastern Rolling Mill Co., with offices at 1600 Arch Street.

EDDIE PHILLIPS has joined the Tyson Roller Bearing Corpn., Massillon, Ohio, as field sales engineer in charge of mine car anti-friction bearing applications in the southern West Virginia field. Mr. Phillips held a similar position with the Timken Roller Bearing Co. for about 16 years.

HARRY C. BROWN, formerly vice-president of the Newhall Chain Forge & Iron Co., New York, has been elected president, succeeding the late Henry B. Newhall. Mr. Brown has been associated with the company in various capacities for about 34 years and since 1909 has served as vice-president in charge of manufacture and sales. The company is no longer connected with any other corporation, as it was up to about seven years ago.

DR. IRVING FISHER, professor of political economy, Yale University; D. T. LAWRENCE, chairman of Trunk Line Association; PAUL H. NYSTROM, professor of marketing, Columbia University; LAURANCE H. SLOAN, Standard Statistics Corp'n., and FRANK H. SOMMER, dean of New York University Law School, have been added to the advisory staff of the National Industrial Advisory Corp'n., New York and Washington, a private organization engaged in assisting industries in the practical operations of the N.R.A.

HAROLD A. LOMAX, for the past two years with the Pittsburgh Steel Foundry Corp'n., Glassport, Pa., has resigned to become associated with Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

FREDERICK D. ROGERS, 80 Federal Street, Boston, has been appointed to handle sales in Maine, New Hampshire, Vermont and Massachusetts east of Worcester County for the Copus Engineering Co., Worcester, Mass., maker of blowers, steam turbines, generators and ventilating equipment.

EMMETT K. CONNEELY has been appointed manager of railroad sales by Republic Steel Corp'n. He served in various capacities with the Pittsburgh & Lake Erie Railroad during his early business life, joining the Standard Steel Car Co. during the War. He was later connected with the New York Air Brake Co. as vice-president and became vice-president of the Pullman Co. at New York upon that company's acquisition of Standard Steel Car Co. He was subsequently made vice-president of Standard Steel Car Co. at Chicago. Mr. Conneely will make his headquarters at the Republic general offices in Youngstown.

## PERSONALS

J. RALPH PATTERSON, formerly manager of roll and alloy casting sales, has been appointed general manager of sales for the Mackintosh-Hemphill Co., Pittsburgh. He has been associated with the company since it absorbed the Pittsburgh Iron & Steel Co. with which he previously was identified, and has served the two companies for the past 18 years. His former connections included the Pittsburgh Crucible Steel Co. and the Jones & Laughlin Steel Corp'n. He was born at Beaver, Pa., in 1895 and attended local schools.

W. T. FILMER has been appointed supervisor for safety of the Youngstown district plants of the Youngstown Sheet & Tube Co. He was formerly fire prevention director of the company.

HAKON A. BERG, for the past three years vice-president and general manager of the Sloss-Sheffield Steel & Iron Co., Birmingham, has been elected president of the Woodward Iron Co., Woodward, Ala., effective Sept. 20. A. H. WOODWARD continues as chairman. R. M. MARSHALL succeeds Mr. Berg as vice-president and general manager of the Sloss-Sheffield company.

WALTER F. CAHILL, formerly identified with the Krueger-Wayne division of the Ex-Cello Aircraft & Tool Co., Detroit, has been made sales representative in the Detroit area for the

National Automatic Tool Co., Richmond, Ind. R. J. Crossett has become sales representative in the Chicago territory, where he will be associated with D. L. RILEY, manager of the Chicago sales office, at 1908 Engineering Building.

H. L. DERBY, JR., has become manager of the Chicago district, with headquarters at 20 North Wacker Drive, for the American Cyanamid & Chemical Corp'n., New York.

C. C. ABBOTT, who has been identified in sheet sales work in the Phila-



J. R. PATTERSON



▲ THIS WEEK IN WASHINGTON ▲

## How to Get Capital Goods Moving Is Serious Government Problem

**W**ASHINGTON, Sept. 19.—This is a capital goods depression. The bulk of unemployment is and always has been in capital goods industries. The depression will be solved only when men get back to work. This is more true of the United States than it is of Europe. The United States is a growing country as to population. Its economic development is based on obsolescence rather than on the physical length of life of equipment. The railroads are in one respect an exception to this principle. Rail carriers have locomotives that are 40 years old and should have been retired long ago. In competitive industries obsolescence generally is a matter of only a few years, often only two or three. This is notably true of the progressive and highly competitive automotive industry.

The necessity of restoring the capital goods industries to a prosperous basis before the country can be brought out of the depression now is fully recognized by the Roosevelt Administration. It is a subject of daily conferences among officials. General Hugh S. Johnson has stated that he has given considerable thought to the matter of equipment buying and the replacing of obsolete equipment in connection with the "Buy Now" drive to be formally inaugurated tomorrow by the National Recovery Administration. To be successful, this drive must go far beyond the usual campaign. It must include capital goods.

Stimulation of the capital goods market has turned the attention of the Administration to two of its important branches, the railroads and construction. Government financing on a large scale is in contemplation. Under existing conditions of the long term bond market there appears to be no alternative. Private capital wants a clearer financial horizon than is now to be seen before purchasing this class of securities.

The value of capital goods involves a heavy outlay for a durable product

By L. W. MOFFETT

Resident Washington Editor  
The Iron Age

which pays for itself through service rendered over a long period of years. Money to finance such goods habitually comes from the long term bond market. At present the long term capital market is non-existent. Even the Federal Government has not borrowed on more than an 8-year maturity.

### Why There Is No Market

Three principal reasons have been given for the lack of a capital market:

1. The Federal Government's monetary policy. No one knows what the dollar is going to be worth one year hence. Just at this moment extreme inflationists are pressing hard for the issuance of fiat money. Senator Pat Harrison of Mississippi, chairman of the Committee on Finance, is strongly urging inflation on the President, and has stated that "if something is not done through rational currency inflation to raise commodity prices, the next Congress will repeal the President's discretionary powers, and make monetary inflation compulsory." There are many who see moderate inflation as necessary but are apprehensive over the radical view of many of the inflationists. In view of this situation it is natural that there should be a decided resistance against tying money up in long term bonds.

2. Misgiving over the new securities act. The law has real teeth in it. Its interpretation is a matter of concern.

3. Depression psychology and lack of confidence in the character of recovery and fear of increasing labor troubles.

**T**O show that the long term bond market is non-existent, it has been pointed out that for each dollar in long term corporate bonds and notes issued in the first seven months of

1933, \$2 was issued in 1932; \$13 in 1931; \$36 in 1930, and \$49 in 1929.

This is the money that finances capital goods. As represented by construction the value of the product in each of the five years before the depression was approximately \$10,000,000,000, or almost the same as the value of agriculture. Taking the vast bulk of this money off the market assuredly gives an adequate conception of its significance with relation to employment, production and purchasing power. It follows that capital goods must be brought into the picture if prosperity is to be restored.

The objective, therefore, is to provide a means of financing the capital goods industries and creating an incentive for the goods. The requirements for doing it are the belief that it will be profitable to purchase capital goods and the ability to get the money.

Since the Government's own policy has killed the long term capital market it is realized that it is necessary either to have a change in the Government policy in order to get private capital to do the job or the Government itself must do it.

It is self-evident the Government will not change its policy over night. Politics, international policy, the cumbersome character of such a quick change, at once project themselves as obstacles to such a sudden change.

Seeing that the capital goods market is the neck of the recovery bottle, the Government will have to change its policy in order to encourage private capital, in the doubtful event that it can be done at this time. So if the Government makes the plunge it must do it by taking the place of the private capital market.

### Government Has Two Budgets

**T**HE Government has two budgets—the regular budget and the emergency budget. It is trying to balance the former. The emergency budget is set up to lick the depression. Amortiza-



tion of expenses is to be done over a period of prosperous years.

Careful analysis has brought important Government representatives to the conclusion that it would be a big step forward if the emergency budget were centered on speedy, non-red tape tackling of the capital goods problem. There arises the question of how to do the job. It is realized by the more thoughtful students of the situation that all that can be done is to help along. There will be no miracles. The country has become suffused with miraculous promises and ballyhoo. Stated in other terms, it is bored to tears.

Those who have given closest attention to the capital goods problem declare that the railroad equipment end is a job that can be done. By no means intended to be airy, their dogma is that the way to build railroad equipment is to build it. Secretary of the Treasury John Sherman under President Hayes resumed specie payments through the application of the conviction that the way to resume is to resume.

By railroad equipment those urging its construction under Government financing refer principally but not entirely to locomotives. They take the position that, first, there is an economic need for it. New equipment displacing the oldest equipment, it is urged, would pay a large return on capital investment. The crux of the situation, it is maintained, comes down to the natural railroad psychology. It is not believed possible to get the carriers to take the initiative. They went out in 1930 to "save the country" and suffered heavy losses. They will be slow to do it again. The railroads have been in the valley of the shadow of death in bankruptcy for a long time with no money to discharge obligations and unwilling to borrow except where necessary and often finding that difficult. The upshot is the railroads must be handled on a platter. The President hardly could let the railroads have money at 1½ per cent when asking more from the farmer, the small home owner, etc.

The conclusion is that the Government, therefore, can not lend money to the railroads at cheap enough rates to get them to borrow. Also, there is the fear by the railroads of Government ownership. When they borrow from the Government they have to give a lien on their properties. Railroads already owe the government several hundred millions of dollars. They will repay those debts before they buy new equipment. They do not propose to go into debt more deeply. It is also to be recalled that when a railroad has borrowed Government money it has had to reduce the salaries of its chief executives if the Government thought, as it so often has, the salaries were too high. Moreover, if a railroad happens to go into receivership and the Federal courts appoint officers of the railroad to run the receivership, the officers' salaries are cut sharply.

#### Government Should Buy and Lease, Is Growing Opinion

THIS situation has developed the opinion that the soundest expenditure the Government can make to end the depression is to buy railroad equipment and offer it to the carriers on such terms that they would eagerly accept when conditions are better. It is reasoned that in one year or more the railroads will be compelled to buy the equipment. It requires that long to get delivery on locomotives. The costs will be more than they would be if purchases were made now. The solution, it is pointed out, is to have the Government go out today and place orders for several hundred millions of dollars for railroad equipment. Immediately, orders would be placed for steel, metal-working machinery and other requirements for the construction of the railroad equipment, thus giving industries much needed business and putting men to work and providing greater returns and savings for users, who would get deliveries when it is probable they will be greatly needed. The Government, it is explained, would sell on time in large part or wholly. It is contended also that railroad equipment notes will then be so good that private interests probably will be anxious to handle them. Even if this situation did not develop, the point is made that carriers in good financial condition would be willing to pay a rate that would let the Government out and permit the railroads to have all the savings. At present a small number of railroads could do that provided they were ready to take the risk. Quite naturally railroads want to remain in a strong cash position to see themselves through the depression. Railroads of this kind and others not in such a good position probably would choose, it is maintained, to buy from the Government either for cash or part cash and by use of the customary railroad equipment notes.

Meanwhile, the plan contemplates putting a thoroughly vendible property in the hands of the railroads on lease or terms that would permit the Government to come out whole and so profitable to the railroads that they could not afford not to lease.

The plan practically is already in existence. A railroad equipment corporation to facilitate the purchase of equipment was organized in 1931. It was prepared in cooperation with the Government to buy equipment on a smaller cash down basis than through the use of the ordinary railroad trust notes. It did not get under way, it is stated, because of lack of law for Government financing. It is now urged that it would be advisable with that corporation or one similar to it for the Government to act, setting up enough money to do the job and assume the responsibility for it. It is stated that the National Recovery Act sufficiently broadens the law to make loans for

railroad maintenance and equipment by Government financing. The law empowers the President through the Public Works Administrator or such other agencies as he may designate "to aid in the financing of such railroad maintenance and equipment as may be approved by the Interstate Commerce Commission as desirable for the improvement of transportation facilities."

#### Residential Improvement

The idea of financing residential construction has been given particular study. It is pointed out that the difficulty with that type of construction is there still are vacancies, and for the Government to enter upon a large residential construction program would demoralize values and be harmful to short term insurance companies, banks, and other agencies which finance such projects.

HOWEVER, there is a great deal of resiliency for demand for residential houses for the "unscrambling" of families who by reason of financial circumstances were forced to double up. But the danger of breaking down further already depressed real estate values has brought about the conclusion that any residential program is a financial menace. It probably would be politically impossible because of pressure of private interests financing such work. The upshot is that thought has turned to a demolition program, partly seen in the low-cost housing projects which are being financed on a small scale at present from the Public Works funds. The program considered calls for tearing down old, ill-located houses, now a dead investment, while subjected to taxes. A substantial residential program, it is urged, is justified as an emergency provided there is linked with it a sufficiently large demolition program covering houses which have outlived their usefulness, have small value and are a social menace. This program, it is declared, must be financed by the Government.

#### Locomotive Backlog Was 79 on August 31

WASHINGTON, Sept. 19.—Three railroad locomotives were shipped in August, two of the steam and one of the electric type, with one steam locomotive being exported, according to reports to the Bureau of the Census. No shipments were made in July. Total shipments in the first eight months of 1933 were: four locomotives compared with 66 in the corresponding period of last year. Unfilled orders at the end of August, 1933, totaled 79 locomotives compared with 80 at the end of July.

## Coal Code Was a Victory, But For Whom?

**W**ASHINGTON, Sept. 19.—Signing of the bituminous coal code, brought about after eight weeks of both dreary and tumultuous bickering, still leaves doubt as to whether organized labor has been recognized. Officials of the United Mine Workers of America say that it means just that. On Aug. 28, General Hugh S. Johnson, National Recovery Administrator, announced a basic agreement had been reached, involving recognition of the United Mine Workers of America. Non-union operators in the Appalachian region and in the southern districts have been almost completely silent on the subject so far as the public is concerned. It is certain they have not announced that they have recognized any union.

Despite the announcement of General Johnson regarding agreement on a basic code, negotiations once more reached a deadlock and it became so serious that on Sept. 7 he handed a Government written code to the operators. It was the object of a volley of objections from non-union operators. President Roosevelt again called all conferees to the White House on Sept. 14, and fixed a "deadline" of 24-hr. for a signed code. "Grace" finally was allowed but the code was signed by all operators except those in West Kentucky and Alabama. Wage differentials undoubtedly played an important part in delaying the code, but the big issue was the open shop and closed shop issue. The strikes that broke out in Pennsylvania were blamed on delay in signing the code, and even after it was signed miners were waiting assurance that the union has been recognized before returning to work.

### U. M. W. Not Mentioned in Code

Non-union operators who have said anything at all have stated that it was not wage "contracts" that they have signed with the United Mine Workers. They say they have signed wage "agreements," involving the President of the United States, the United Mine Workers and themselves. They say this is required under the Recovery Act, and point to Sec. 4 (a), which, in part, says, "The President is authorized to enter into agreements with, and to approve voluntary agreements between and among, persons engaged in a trade or industry, labor organizations, and trade or industrial organizations, associations or groups, relating to any trade or industry, if in his judgment such agreements will aid in effectuating the policy of this title," etc. It has been observed in this connection that when negotiations were drawing to an end, J. D. Francis, Appalachian operator, said that wage "agreements" between the operators and the

United Mine Workers of America had not been completed. The fact remains that the general view is that whatever distinction it is sought to draw the union has been recognized and some non-union operators have predicted that the code means complete unionization of the soft coal industry, including captive mines, such as those owned and operated by steel and other industrial units. Because of increased wages arising from the code, it is claimed coal prices will advance sharply. One estimate has been made that the code will mean increased costs of approximately \$15,000,000 a year for the railroads without taking into account railroad-owned mines.

### "In Agin, Out Agin"

The code, however, was not entirely satisfactory to the United Mine Workers. For non-union operators, though unable to get into the code a much-coveted open shop declaration, insisted they must have some protecting clause in the code to make it clear that membership in a union was not essential in order to give miners the benefits of the code. They said too the possibility of recognition of company unions must not be given up. So finally, the Appalachian operators were able to reach an agreement to insert General Johnson's own "clarification" clause, reading in part as follows:

"This can mean only one thing which is that employees can choose any one they desire to represent them, or

they can choose to represent themselves. Employers likewise can make collective bargains with organized employees for individual agreements with those who choose to act individually."

President Roosevelt in giving approval struck out interpretation clarifying labor provision of Recovery Act. This was done upon insistence of organized labor through the Labor Advisory Board. Action of the board was urged by President Green of the American Federation of Labor and President John L. Lewis of the United Mine Workers. It is reported that despite the elimination of this interpretative clause, coal operators who have signed the code will accept it although previously they had insisted upon insertion of a clarifying clause. This clause was prepared some time ago by General Johnson and general counsel, Richberg, of the NRA.

The upshot apparently will be determined only by actual operations under the code. By many it is believed that court action to test the Recovery Act will see its initial source as the coal code. Alabama and Western Kentucky operators, who have refused to sign the code, have implied strongly they would resort to the courts, if necessary. They are protesting against recognition of the union and also against wage rates.

United Mine Workers also are disturbed over the recognition that apparently will have to be given to some degree at least to the Progressive Miners' Union in Illinois. It is said this group, described as radical, is gaining much strength and is making fast inroads in its bitter campaign against the United Mine Workers Union.

## R.F.C. Builds Credit Bridge to Cross NRA Cost Gap

**W**ASHINGTON, Sept. 19.—Bridging NRA industries over the next six months to cover increased costs arising from operation of codes is the purpose of the credit program proposed by the Reconstruction Finance Corporation.

Announced last Thursday by Chairman Jesse H. Jones, following several conferences with the President, the program calls for loans by the R. F. C. to bank and trust companies and mortgage companies at 3 per cent interest, the borrowers to relend to business and industry at a rate not to exceed 5 per cent.

It is stipulated that the funds shall be used for three purposes:

For the purchase of materials for manufacture.

To cover the actual cost of labor in the manufacture and processing of material.

To assist merchants especially affected by the NRA.

Mr. Jones declared the plan to be an inflationary program, stating that the best inflation is credit expansion when established on easy terms.

The loans will be made by the R. F. C. through a broad range of collateral, including short-term notes of manufacturers or merchants, a valid assignment of an unconditional order for the finished product and mortgages, real or chattel, on plant, equipment, real estate, raw material or finished product, "or in any manner acceptable to the bank and to the Reconstruction Finance Corporation."

Reiterating a recent statement he made, Chairman Jones said that where banks do not want to borrow for such purposes, or in those instances where the loan is more in the nature of operating capital, the organization of



bona fide mortgage companies in each community or borrowing through those now in existence is suggested. Loans to mortgage companies, when properly secured, he stated, will be made up to five times the cash or sound capital of the mortgage company and carry an interest rate from the R. F. C. of 4 per cent.

Mr. Jones added:

"Bulletins are being sent to all Reconstruction Finance Corporation Agencies covering these points, and the cooperation of banks, mortgage companies and others in a position to lend assistance in the recovery program is earnestly solicited.

"While all applications will be made through the Reconstruction Finance Corporation Agencies, a department will be established at the Washington office to give especial attention to loans contemplated under this plan.

In addition to the foregoing and to further assist in the recovery program, the Corporation will reduce its base lending rate from 4½ per cent to 4 per cent, that is, to such borrowers as banks, mortgage companies, insurance companies and others that are now paying 4½ per cent.

"It is the opinion of the directors of the Reconstruction Finance Corporation that much needed relief can be had by the organization and use of local mortgage companies of substantial nature to supplement bank lending where loans are of a sound character, but slow.

"A liberal use of the above, coupled with widespread cooperation by banks in supplementing the nation's banking structure through the issuance of 5 per cent preferred stock to be sold to the Reconstruction Finance Corporation, will naturally bring the banks in more effective assistance in the President's recovery program."

## Northern Metal Co. Gets Three Vessels to Scrap

WASHINGTON, Sept. 19.—The Northern Metal Co., Philadelphia, was the successful bidder for the navy vessels Galveston, Denver, and Niagara, which are to be scrapped.

## Gray Iron Institute Will Change Name

GRAY Iron Institute, Inc., Cleveland, will change its name to the Gray Iron Founders Society, Inc. The change has been adopted by the directors and submitted to the members for approval, together with changes in the by-laws that have been adopted in order that the institute may function efficiently under the NRA.

## PWA's Recovery Mill Grinds Out More Allotments

WASHINGTON, Sept. 19.—Immediate purchase of tools, shop equipment and heavy machinery will be made by the Navy Department from an allotment of \$2,100,000 announced last Thursday by Federal Administrator of Public Works Harold L. Ickes. Officers established that many of the tools now in use by the Navy are obsolete, and some of the shop equipment has passed the stage where it is useful or economical. The Administration also was informed that as a result of the allotment purchases would give employment to more than 2000 men in factories throughout the country for a period ranging up to a year. The heavy machinery and tool plants were reported in great need of work, and this action gave the Administration a way to immediately effect this purpose in moving men from relief rolls to payrolls, thereby increasing purchasing power, while simultaneously required material is provided the Navy.

### Mississippi River Improvements

An allotment of \$22,000,000 for the construction of locks and dams on the upper Mississippi, where the need of employment is pressing, also was announced by Mr. Ickes. This allotment is in addition to an authorization of \$11,500,000 made by the Administration for the dredging of a 9-ft. channel on the upper Mississippi between St. Louis and Minneapolis as a part of a comprehensive program of river improvements. Plans for the dredging of the channel have already been completed by the Army Engineering Corps, but the locks to be built at once under the new allotment have not yet been selected, although the most available sites have been inspected and a decision is to be made quickly by the Army Engineering Corps. Those in charge have been instructed by Secretary of War Dern to move with a maximum of speed in beginning work on the locks.

### Non-Federal Projects

Allotments for 11 non-Federal projects in eight states, totaling \$4,097,027, cover waterworks and sewage systems, schools, bridges and utility works. All have been approved by the State Advisory Boards and State engineers and qualified before the Washington headquarters legal, financial and engineering examiners. Four of the allotments, one of \$20,000 for a bridge for Red River Bridge, Ark., one to Detroit, Mich., \$300,000 for street repair work and paving, and another for Detroit for \$21,000 for sewage work, and one of \$290,256 to Omaha, Neb., for extension and improvement of the gas and water supply systems were grants. They

represent 30 per cent of the cost of material and labor. The other allotments included both loans and grants.

A loan and grant of \$904,364 was made to Springfield, Ohio, for sewage works. The project consists of construction of intercepting sewers and branches 35,500 ft. in length, out-fall sewer 1800 ft. in length and new sewage treatment works. To Oshkosh, Wis., the Administration made a loan and grant of \$968,000 for sewage works and treatment plants.

Among other loans and grants included in this group were:

Green, Bay, Wis., \$722,907 for sewage work.

Augusta, Ga., \$710,000 for a school.

North Kingston, R. I., \$110,000 for waterworks.

An allotment of \$1,500,000 was granted for construction work in Puerto Rico, \$1,000,000 for public roads and highways and \$500,000 for draining and reclaiming lands.

To permit immediate construction work on the Grand Coulee dam project on the Columbia River an allotment of \$1,000,000 was made. The money will go to the Bureau of Reclamation, Department of Interior, and is for the construction of working quarters and facilities for engineers and other construction forces on the site and the erection of a bridge there across the Columbia River to enable the work to be carried simultaneously on both sides of the river. The \$1,000,000 allotment is in conjunction with a previous tentative allotment of \$63,000,000 to an authority of the State of Washington, contingent on completion of a satisfactory contract with the Administration for financing the Grand Coulee dam projects. Legal difficulties, which may require legislative action in Washington, have delayed consummation of the contract, which would result in holding up the work were the \$1,000,000 allotment not made.

Preliminary plans have been completed and work will start shortly on dredging a 6-ft. channel and building retaining walls at Ocean City Harbor and Sinepuxant Bay, Md., through the use of a Federal allotment of \$281,000. The State of Maryland will provide \$500,000 for the work to be done under the supervision of the War Department. The construction will repair damage caused in the recent storm.

A public works loan of \$250,000 to the Jacksonville Produce Terminal, Inc., for the construction of a ship-side terminal market and dock at Jacksonville, Fla., and an allotment of \$60,000 for flood control work on the Rio Grande, near San Benito, Tex., were also made.

## Valve Code Hearing Held— Drop Forge Code Filed

**W**ASHINGTON, Sept. 19.—Hearings were held yesterday on the code of fair competition for the valve and fittings manufacturing industry, filed by the Valve and Fittings Institute, claiming to represent 94 per cent of the industry.

The code provides for a maximum work week of 40 hr., except in emergencies and exclusive of executives and those in technical capacities receiving more than \$35 a week, with time and one-third for overtime. It also provides a minimum wage of \$15 a week in cities of 500,000 or more, scaled down to \$12 in towns of less than 2500, provided that office boys and girls and learners shall receive not less than 80 per cent of the minimum. The minimum rate for factory workers and similar classifications is 40c. an hour unless the rate was lower on July 15, 1929, and in no event less than 30c. an hour.

### Can Code Hearings Wednesday

Hearings on the code for the can manufacturers will begin tomorrow before Deputy Administrator H. O. King. It fixes a 40-hr. week with a tolerance to meet contingencies but in no event more than 48 hr. for a period of 12 weeks, without payment of overtime. The minimum wage is fixed at 30c. in the North and 27½c. in the South and in Hawaii not less than the minimum rate July 15, 1929, provided that 80 per cent of the employees in each factory shall receive higher rates of wages than specified in these minimum rates.

### Drop Forge Code

The code of the American Drop Forging Institute fixes a 40-hr. week, averaged over six months, with not more than 48 hr. in any one week, with allowances for peak demands, for factory workers, at 40c. an hour. The rate for piece workers is not to be less than the non-piece rate. It is also provided that there shall be no reduction in wages. The provisions as to rates of wages are not applied to apprentices over 16 years of age. The code carries the "individual merit" clause in its labor provisions, a clause that has been barred by General Johnson.

It provides the machine-hour rate method of cost accounting developed the past 12 years by the Institute. The Executive Committee of the Institute is to be the planning and fair-practice agency for the industry and is given broad powers for administration of the code. The committee is authorized to recommend from time to time a form for estimates of cost accounting for all or any part of the operations of the industry and when

adopted it is to be used exclusively by all persons in the industry. Production is to be computed on an hourly basis and all contracts are to state the minimum release for fabrication. Original sets of dies and special tools are to be paid for by the purchaser at not less than the full estimated cost. The sale of any product for less than 10 per cent more than complete cost is declared an unfair method of competition. Installation of drop forging machinery, except for replacement, must be preceded by a certificate from the Administrator and prior notice to the committee and after representatives of the industry have been given an opportunity to be heard. Replacement is allowed by any person of tonnage capacity of drop forging machinery owned July 15, 1933, and scrapped after the code becomes effective. Among the statistics which the committee shall require to be furnished a neutral agency selected by the committee are: Capacity and productive equipment; production in hammer hours and ton-

nage; unfilled orders at beginning and end of period; orders received, cancellations and shipments; number of persons employed, wage rates, workmen's earnings and hours of work; changes in productive equipment arranged for or made during the period.

### Gear Code Has "Merit" Clause

The prohibited "individual merit" clause also appears in the code of the American Gear Manufacturers' Association which provides an hourly wage rate of 40c. for shop labor with a 40-hr. week. The association is set up as the supervisory agency. Cost accounting is to be in accordance with the system issued by the association. The code declares to be an unfair method of competition the sale or exchange of any product below reasonable cost. It is stated that the code is intended to be a basic code to cover the entire industry with the understanding that groups of manufacturers representing a substantial part of any specific industry or trade group may form a supplementary code of fair competition, defining specifically its industry and covering such additional regulations as are considered advisable.

## PWA Gains Momentum, Housing Projects Are Qualified

**W**ASHINGTON, Sept. 19.—Gathering momentum, the Public Works Administration has considerably quickened its speed in making allotments of funds for both public and private projects. The allotments showed the increased functioning of the decentralized State organizations of the Administration in their efforts to reengage employment and turn business to the steel and many other industries for materials that are involved. Notable in loans for private projects are those for low-cost housing. In one day alone recently, allocations for this purpose totaled almost \$13,000,000, of which \$8,149,000 is for two projects in New York City, and \$4,460,000 for one in Indianapolis. Allotments for State and municipal projects mounted up into high figures, running in one day almost to \$26,000,000 with smaller sum subsequently made. More such allotments will be announced, it was stated by Public Works Administrator Harold L. Ickes, as the rapidly built organizations come into full play.

State and municipal projects, made after night and day work to permit essential examination and inspection, are being qualified so that work may be pushed as soon as possible. The law permits the Government to make

outright grants up to 30 per cent of the cost of labor and materials. Public bodies are taking advantage of this opportunity to meet part of the expense of their local construction while they finance the balance through other means. Where loans are made for complete coverage of costs, the remaining 70 per cent is secured by 4 per cent general obligation bonds. Sewerage, water, park, highway, school, street and dry dock construction constitute the principal projects under the tentative allotments.

### Among the Projects

Included among the projects, both private and others, for which allotments have been made are the following, the figures covering total costs unless otherwise indicated:

Hillside Housing Corp., \$5,184,000 (subject to satisfactory contract), for housing project in the Bronx, near Post Road, New York City, for low-cost housing, consisting mainly of 1435, four-story, walk-up apartments, with a few six-story elevator buildings.

Hallets Cove Homes, Inc., \$2,965,000 (subject to satisfactory completion of plans and satisfactory contract), low-cost housing project, bordering on East River, directly oppo-



site Carl Schurz Park, Borough of Queens, New York City, consisting of 31 separate apartment house units, six-story fireproof elevator apartments.

Indianapolis Community Plan Committee of Chamber of Commerce, \$4,460,000 (subject to development of plans and satisfactory contract), for tearing down of 750 slum dwellings and erection of 200 economical sanitary houses, designed mainly for negroes.

Limited Dividend Corporation organized by citizens of Raleigh, N. C., \$168,000 (subject to satisfactory completion of plans and a satisfactory contract), non-fireproof, three-story buildings, containing 54 apartments, particularly adapted to house State employees and teachers and students of State University.

Sacramento, Calif., \$11,700,000; construction of complete gravity water supply system for Sacramento and vicinity.

State of Colorado, \$10,000,000; highway construction. May require state legislative action.

Springfield, Ill., \$1,385,000; water purification and pumping plant, water mains, and extensions.

Tampa Shipbuilding & Engineering Co., Tampa, Fla., for construction of dry dock.

Cleveland, Ohio, Metropolitan Park Section, \$650,000; highways, bridges and shelter houses.

Fargo, N. D., \$512,000; construction of sewage disposal plant.

Cincinnati, Ohio, \$160,000 (grant); for construction of sanitary and storm sewers. Total cost, \$543,000.

Bel Air, Md., \$124,750; for construction of complete sewerage system.

Salem, Mass., \$34,000 (grant); street construction. Total cost, \$116,000.

Fort Atkinson, Wis., \$18,315 (grant); sewage disposal plant. Total cost, \$58,310.

Huntingburg, Ind., \$84,750; construction of water system.

Cincinnati, Ohio, \$27,000; street improvements.

Clear Spring, Md., \$23,000; gravity water system.

Vienna, Md., \$27,000; waterworks system.

Merrill Water Co., Merrill, Ore., \$17,000; to build wells and pumping station.

New Hampshire, \$220,000 (grant); two publicly owned toll bridges. Total cost, \$1,100,000.

Pittsburgh Steel Co., in its fiscal year ended June 30, had net loss of \$2,339,402, compared with \$2,501,081 in the preceding period. Shipments for the fiscal year totaled 129,477 net tons, compared with 165,263 tons in 1932 and 532,563 tons in 1929.

## Specialized Machinery and Equipment Codes Progress

WASHINGTON, Sept. 19.—Proposing a 40-hr. average work week and a minimum wage of 40c. per hour in cities over 250,000 population and 35c. an hour elsewhere for factory employees, a hearing on a code of fair competition for the manufacturers of road machinery developed opposition to an amendment of the code committee placing dealers under the manufacturers' code. The protests came from E. Hurst, a distributor, and B. C. Heacock of the Caterpillar Tractor Co. They declared that distributors, some 200, want a code of their own. Objection to the proposed wage differentials based on population was made by W. R. Adams of Indianapolis. He said living costs in Indianapolis are as high as in larger competing cities. Fred Hewitt of the Metal Trades Division, American Federation of Labor, asked for a 30-hr. week, a minimum wage of \$25 and a voice in code administration. Harry Stevenson, vice-president of the International Molders' Union, made the same request, supplemented by a proposed scale of \$38 for molders and core makers. Mr. Hewitt attacked the "merit clause" in the labor provision, saying it was sought to nullify the cooperative bargaining guarantee provided in the Recovery Act.

### Some Codes Contain "Merit" Clause

Codes submitted by the steel tubular and firebox boiler industry, the railway brass car and locomotive journal bearing and casting industry, and the hand chain hoist industry carry the "merit" clauses. The latter two also declare for the open shop by use of the term itself. General Johnson has said the terms "open shop" and "closed shop" will not be permitted in codes. He has also said the "merit" clause would be struck out in future codes, having been permitted to go into the automobile code.

The steel tubular and firebox boiler industry code was submitted by the Steel Heating Boiler Institute. It provides for a 40-hr. week for factory workers, with a minimum hourly rate of 30c. in the South and 35c. in the North and sets up a list of trade practices which are declared to be unfair.

The code of the Association of Manufacturers of Railway Brass Car and Locomotive Journal Bearings and Castings fixes an average 40-hr. week in any 13 weeks and an 8-hr. day for molders, mechanical workers and artisans. The wage scale is graduated on a population basis and ranges from \$12 in towns of less

than 2500 to \$15 in cities of over 500,000.

The code of the Hand Chain Hoist Institute fixes a 40-hr. week, with allowance for peak demands, but aggregate overtime shall not exceed 100-hr. in a year. The hourly rate for male workers is 40c. and for female workers, 30c.

Hearings will be held on Sept. 21 before Deputy Administrator Philip C. Kemp on two competing codes filed for the office equipment industry. One code was submitted by the Office Equipment Manufacturers' Institute, claiming to represent 70 per cent of the industry. The other code was presented by the Business Furniture Storage Equipment and Supply Association, claiming to represent 88 per cent of the industry.

### Blue Eagle Modifications

Modifications of the President's Reemployment Agreement have been announced by the National Recovery Administration for the following industries:

Shoe machinery: Work-week of 40-hr. for factory employees, increased to 48-hr. in peak season, with overtime in excess of 40-hr. per week or 8-hr. a day, with a limitation to 32-hr. of overtime in any six months. Minimum wage, 40c. per hour for male employees and 35c. for female employees, provided that where substantially the same work is performed, male and female employees shall receive the same rate of pay; overtime to be paid at rate of time and one-third.

Non-ferrous hot water tanks: For factory workers, 40-hr. week, with 10 per cent tolerance for outside classifications; minimum wage, 40c. an hour.

Packaging machinery industry: For factory workers, 40-hr. week, any time over 8-hr. per day and 40-hr. per week to be considered overtime. Minimum wage, 40c. unless the rate was lower on July 15, 1929, and in no case less than 30c. an hour; overtime to be paid at rate of time and one-half.

The code for the galvanizers' industry, submitted by the National Galvanizers' Association, carries the much-discussed "individual merit" clause, sets an hourly wage of 40c., a 40-hr. week, with a limitation of 48-hr. in peak seasons and sets up an Emergency National Committee as the general planning and coordinating agency for the industry. Galvanizers are required to publish and distribute among each class of purchaser and with the secretary of the National Galvanizers' Association, his prices applicable to the various types and sizes of products. Included

in the price list or in supplementary writings are to be all conditions of sale, such as terms, discounts, allowances, and guarantees.

#### Steel Joist Institute Names Basing Points

Pittsburgh, Chicago and Birmingham are named as basing points for the steel joist industry in a code filed by the Steel Joist Institute. Like requirements of the steel code, invoices are based on published list prices and the all-rail published freight charges from the basing point to the place of delivery, or if such place of delivery shall be the basing point, the published tariff switching charges. In case of materials being used in the erection of a definite structure the freight charges are to be computed to the nearest railroad freight station, but if the materials are actually delivered to the job the trucking charges are to be added. The wages, hours of work and conditions of employment are established in strict accordance with those applying under the steel code.

An hourly wage rate of 40c. is provided for plant workers in the code filed by the National Institute of Used Machinery and Equipment. It is provided, however, that if the rate was less than 40c. on July 15, 1929, the wage on the day shall prevail, but shall not be less than 30c. A 40-hr. week is established with the right to working a maximum of 48-hr. in any six weeks within a period of six months. The code sets up a National Institute of Used Machinery and Equipment Dealers Board as the coordinating agency for administration. The board proposed would consist of 11 representatives of the National Institute to be selected from as many types of machinery handled.

### Ryder Heads New Tariff Adjustment Division

WASHINGTON, Sept. 19.—The National Recovery Administration has added to its already prodigious job by setting up an Imports Division for the purpose of making tariff adjustments, restrictions or payments of fees. Any industry, labor or trade organization which has complied with the terms of the Recovery Act is entitled to complain to the President that articles are being imported to the detriment of the competitive position of similar domestic articles. The President is empowered to have an immediate investigation made, and may, after such investigation, require the payment of fees or may restrict the importation of such articles. As a general rule, it was announced, the industry making the complaint will be expected to make a prima facie case before its request will be forwarded to the President. Requests for relief

may be made only after a code has been approved.

Heading the division is Oscar B. Ryder, Alexandria, Va., assistant chief of the Economics Division of the Tariff Commission, who has been loaned to the Recovery Administra-

tion. Mr. Ryder is a graduate of the University of Virginia, did graduate work in economics at Harvard and formerly was a professor of economics at the University of Kentucky. He has been connected with the Tariff Commission for 14 years.

## ... OBITUARY ...

ALEXANDER MILNE, metallurgist since 1931 to the staff of the operating vice-president of Republic Steel Corp., Youngstown, died on Sept. 8 after a short illness at the Youngstown Hospital. Mr. Milne was 46 years old. He was long and prominently identified with the metallurgical branch of the steel industry. His career began immediately after his graduation from Harvard University in 1911, when he entered the Vandergrift works of the American Sheet & Tin Plate Co. as metallurgist. Subsequently, he went with the Jones & Laughlin Steel Corp. as chief metallurgist at the Aliquippa plant, and later was transferred to the company's managerial staff at Pittsburgh, where he assumed charge of the metallurgical division of the tin plate and wire departments. In 1931, he joined Republic in a similar capacity under R. J. Wysor, vice-president in charge of operations.

A. S. MAXWELL, sales and advertising manager of J. H. Williams & Co., Buffalo, N. Y., died at his home in Garden City, Long Island, on Sept. 9. He had been identified with the Williams organization for many years and was widely known throughout the automotive, industrial, plumbing and pipe fields.

FREDERICK M. DEVLIN, president of the Philadelphia Hardware & Malleable Iron Works, Inc., died on Sept. 11.

L. A. VINCENT, sales manager of the Swindell-Dressler Corp., Pittsburgh, died of a heart attack at Gary, Ind., on Sept. 7, aged 38 years. He received a degree in chemical engineering from the University of Pittsburgh. He entered the employ of the American Dressler Tunnel Kilns, Inc., Cleveland, in 1920, as thermal engineer and became vice-president and sales manager in 1928. After the consolidation of his company with William Swindell & Brothers, Pittsburgh, to form the Swindell-Dressler Corp., he retained the position of sales manager.

NIELS L. MORTENSEN, general works manager, Cutler-Hammer, Inc., died Sept. 12, aged 48 years. He was born in Denmark and came to Amer-

ica in 1905. He became connected with the Cutler-Hammer staff in 1907, becoming chief engineer and more recently general works manager.

HENRY STANLEY WALTER, formerly superintendent and director of the Stanley Rule & Level Co., died at his home in New Britain, Conn., on Sept. 13. He was born in that city Dec. 16, 1848. After more than 65 years of service with the company he retired in 1931.

W. LANIER WASHINGTON, of Westport, Conn., died at his home of a heart attack on Sept. 11. He was born at Montgomery, Ala., Mar. 30, 1865. Mr. Washington was president and general manager of the Elliott-Washington Steel Co. from 1893 to 1898, and chairman and managing director of the Pittsburgh Sheet Steel Mfg. Co. from 1898 to 1901.

FREDERICK J. WOOD, secretary-treasurer of A. M. Wood & Co., Inc., Philadelphia, died in that city on Aug. 28.

CLEMENT CHASE, architect and engineer, Wayne, Pa., was killed instantly on Sept. 18, when he fell 120 ft. from the Philadelphia end of the Delaware bridge while inspecting the span in connection with the construction of a high-speed line. Mr. Chase was associated with Ralph Modjeski in the construction of the bridge. He was 48 years old.

### Machine Tool Orders Higher in August

MACHINE tool orders increased sharply during August, according to the index of the National Machine Tool Builders Association, which rose to 57.4 as compared with 53.9 in the preceding month and 28.3 in August, 1932. The August figure was erroneously reported in last week's issue. The index of shipments for August, which, as in the case of orders, is based on the 1922-24 average, stood at 39.4, as against 35.6 in July and 29.9 in August, 1932. Unfilled orders, as of Aug. 31, were 1.88 times shipments, as compared with 1.64 times shipments one month before.



## Rising Costs and Shrinking Volume Force Industry to Reconsider Prices

Second Wage Readjustment and Certainty of Higher Fuel Costs are Factors—  
Fourth Quarter Prices on Plates, Shapes and Bars Withdrawn

**T**HE combination of declining business volume and rising costs has caused the iron and steel industry to become uneasy about prices recently filed for the fourth quarter. Quotations on plates, shapes and bars for that period have been withdrawn in preparation for advances, and similar action may be taken on other products.

The industry's labor costs have been further increased by a second wage advance which was put into effect by the leading interest and other producers on Sept. 15. The first advance, a flat 15 per cent increase, was made on July 15. The new wage revision provides for increases up to 12½ per cent and is primarily intended to straighten out maladjustments growing out of reductions in working hours.

The industry's fuel costs are likewise headed upward. The final adoption of the coal code will automatically result in higher fuel prices, but the full extent of the increase is uncertain in view of continued labor disturbances in western Pennsylvania.

**M**ARKET activity in the past week has been confined mainly to a bulge in releases of sheets and strip steel on which Sept. 15 had been fixed as the deadline for the acceptance of third quarter specifications. Otherwise bookings have declined, and producers have been forced to reduce their backlogs.

Pressure for shipments, however, has caused a temporary reversal in the trend of production. Although ingot output declined from 34 to 32 per cent at Pittsburgh and from 37 to 35 per cent in eastern Pennsylvania, the Valley rate rose from 45 to 48 per cent, the Buffalo average from 44 to 47 per cent and Chicago operations from 41 to 44 per cent. The national average, which reached 41 per cent a week ago, is now 43 per cent.

The recovery at Chicago is attributable primarily to the receipt of orders for 24,000 tons out of the 31,000 tons of rails recently bought by the Chesapeake & Ohio. The imminent purchase of 10,000 tons of track supplies by this railroad will also aid steel plant operations.

**N**O broad upturn in railroad buying is yet indicated, although the trade is pinning its hopes on the early launching of a Government-sponsored program

under which both rails and rolling stock would be bought on a large scale.

Government-financed construction work is moving more rapidly toward the stage where it will affect iron and steel output. The low bid on the Grand Island bridges, near Buffalo, requiring 13,000 tons of steel, has been announced and the placing of the contract should follow shortly. Structural steel lettings are still light, totaling 6200 tons, as compared with 8165 tons a week ago. New projects of 14,500 tons, compare with 24,560 tons a week ago.

The Navy Department has awarded 1350 tons of plates out of 9000 tons of plates, shapes and bars required for 10 destroyers to be built in its own yards. The submission of code prices made it necessary to decide the awards by the drawing of lots.

**U**NCERTAINTIES growing out of the steel code still perplex the trade. Automobile companies are dissatisfied with the provision that all-rail freight rates be paid on steel, and are demanding the establishment of an arbitrary delivered price at Detroit equal to the Pittsburgh base price plus 15c. or 20c. per 100 lb. They contend that there is no justification for depriving them of the economies obtainable from water and truck shipments, and threaten to purchase all their material from distant mills which would be compelled to ship all-rail.

**C**ODE prices on light rails have again been revised. Light rails rolled from billets, which last week were advanced to \$34 a ton have been reduced to \$32, while light rails rolled from rail steel, which had been raised to \$32 a ton, are now quoted at \$31.

The relation between delivered prices in the North of Southern and Northern pig irons may be subjected to further modification. In most centers delivered prices on Southern iron have been maintained at 38c. a gross ton below those from the nearest Northern furnaces.

Current prices for bolts, nuts, rivets and cap and set screws have been reaffirmed for October only.

Declines at Pittsburgh, Chicago and Philadelphia have reduced THE IRON AGE scrap composite from \$11.42 to \$11.17 a ton. The composite prices on finished steel and pig iron are unchanged at 1.979c. a lb. and \$16.71 a gross ton respectively.

# ▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Pig Iron

	Sept. 19, 1933	Sept. 12, 1933	Aug. 22, 1933	Sept. 20, 1932
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia....	\$18.34	\$18.34	\$17.34	\$13.84
No. 2, Valley furnace.....	17.50	17.50	16.50	14.50
No. 2 Southern, Cin'ti.....	18.23	18.23	17.73	13.82
No. 2, Birmingham.....	13.50	13.50	13.00	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.00	15.50
Basic, del'd eastern Pa.....	17.84	17.84	17.09	13.50
Basic, Valley furnace.....	17.00	17.00	16.00	13.50
Valley Bessemer, del'd P'gh..	19.89	19.89	18.89	16.89
Malleable, Chicago*.....	17.50	17.50	17.00	15.50
Malleable, Valley.....	17.50	17.50	16.50	14.50
L. S. charcoal, Chicago.....	23.67	23.67	23.17	23.17
Ferromanganese, seab'd car-lots .....	82.00	82.00	82.00	68.00

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

## Finished Steel

	Sept. 19, 1933	Sept. 12, 1933	Aug. 22, 1933	Sept. 20, 1932
<i>Per Lb. to Large Buyers:</i>				
Cents				
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.25	2.25	2.25	2.10
Hot-rolled annealed sheets, No. 24, Chicago dist. mill...	2.35	2.35	2.35	2.20
Sheets, galv., No. 24, P'gh....	2.85	2.85	2.85	2.75
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.85
Hot-rolled sheets, No. 10, P'gh	1.65	1.65	1.65	1.55
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.75	1.75	1.75	1.65
Wire nails, Pittsburgh.....	2.10	2.10	2.10	1.95
Wire nails, Chicago dist. mill.	2.15	2.15	2.15	2.00
Plain wire, Pittsburgh.....	2.10	2.10	2.10	2.20
Plain wire, Chicago dist. mill.	2.15	2.15	2.15	2.25
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh..	\$4.65	\$4.65	\$4.25	\$4.75

## Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	32.00	34.00	30.00	32.00
Rerolling billets, Pittsburgh..	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh...	31.00	31.00	31.00	33.00
Wire rods, Pittsburgh.....	35.00	35.00	35.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.60	1.60

## Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh....	\$12.75	\$13.00	\$13.75	\$9.75
Heavy melting steel, Phila....	11.00	11.25	12.00	7.25
Heavy melting steel, Ch'go...	9.75	10.00	10.25	6.25
Carwheels, Chicago.....	10.00	10.50	10.50	7.00
Carwheels, Philadelphia.....	12.75	12.75	12.75	10.00
No. 1 cast, Pittsburgh.....	11.75	11.75	11.75	10.00
No. 1 cast, Philadelphia.....	12.50	12.50	12.50	9.50
No. 1 cast, Ch'go (net ton)...	10.00	10.00	10.50	6.25
No. 1 RR. wrot., Phila.....	12.00	12.00	12.00	7.50
No. 1 RR. wrot., Ch'go (net)...	8.50	9.00	9.00	5.00

## Finished Steel

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.60	1.60	1.60	1.60
Bars, Chicago.....	1.65	1.65	1.70	1.70
Bars, Cleveland .....	1.65	1.65	1.65	1.65
Bars, New York.....	1.95	1.95	1.95	1.95
Tank plates, Pittsburgh.....	1.60	1.60	1.60	1.60
Tank plates, Chicago.....	1.65	1.65	1.70	1.70
Tank plates, New York.....	1.898	1.898	1.898	1.898
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago...	1.65	1.65	1.70	1.70
Structural shapes, New York.	1.86775	1.86775	1.86775	1.86775
Cold-finished bars, Pittsburgh	1.95	1.95	1.95	1.70
Hot-rolled strips, Pittsburgh..	1.65	1.65	1.65	1.45
Cold-rolled strips, Pittsburgh.	2.25	2.25	2.25	1.90

## Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$2.50	\$2.50	\$2.50	\$2.00
Foundry coke, prompt.....	3.25	3.25	3.25	2.75

## Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	8.75	8.75	8.75	6.00
Lake copper, New York.....	9.00	9.00	9.00	6.37 1/2
Tin (Straits), New York....	47.95	46.00	44.12 1/2	24.35
Zinc, East St. Louis.....	4.75	4.65	4.85	3.25
Zinc, New York.....	5.12	5.02	5.22	3.62
Lead, St. Louis.....	4.35	4.35	4.35	3.45
Lead, New York.....	4.50	4.50	4.50	3.50
Antimony (Asiatic), N. Y....	6.75	6.75	6.87 1/2	5.62 1/2

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

# ▲▲▲ The Iron Age Composite Prices ▲▲▲

## Finished Steel

Sept. 19, 1933	1.979c. a Lb.
One week ago	1.979c.
One month ago	1.979c.
One year ago	1.965c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	LOW
1933 .....	1.979c., Aug. 8;	1.867c., Apr. 18
1932 .....	1.977c., Oct. 4;	1.926c., Feb. 2
1931 .....	2.037c., Jan. 13;	1.945c., Dec. 29
1930 .....	2.037c., Jan. 14;	2.018c., Dec. 9
1929 .....	2.317c., April 2;	2.273c., Oct. 29
1928 .....	2.286c., Dec. 11;	2.217c., July 17
1927 .....	2.402c., Jan. 4;	2.212c., Nov. 1

## Pig Iron

\$16.71 a Gross Ton
16.71
15.94
13.64

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1933 .....	\$16.71, Aug. 29;	\$13.56; Jan. 3
1932 .....	14.81, Jan. 5;	13.56, Dec. 6
1931 .....	15.90, Jan. 6;	14.79, Dec. 15
1930 .....	18.21, Jan. 7;	15.90, Dec. 16
1929 .....	18.71, May 14;	18.21, Dec. 17
1928 .....	18.59, Nov. 27;	17.04, July 24
1927 .....	19.71, Jan. 4;	17.54, Nov. 1

## Steel Scrap

\$11.17 a Gross Ton
11.42
12.00
7.75

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW
1933 .....	\$12.25, Aug. 8;	\$6.75, Jan. 3
1932 .....	8.50, Jan. 12;	6.42, July 5
1931 .....	11.33, Jan. 6;	8.50, Dec. 29
1930 .....	15.00, Feb. 18;	11.25, Dec. 9
1929 .....	17.58, Jan. 29;	14.08, Dec. 3
1928 .....	16.50, Dec. 31;	13.08, July 2
1927 .....	15.25; Jan. 11;	13.08, Nov. 22



# Steel Specifications Still Declining at Pittsburgh



**Output Is Off Two Points to 32 Per Cent, But Valley Rate Is Slightly Higher—Fuel Outlook Remains Clouded**

**P**ITTSBURGH, Sept. 19.—Specifications for steel products have declined. Although sporadic improvement in demand for certain classes of steel is discernible, the flow of new business is generally irregular. General establishment of fourth quarter prices has not yet tempted forward buying and consumers reflect extreme caution in covering beyond their imminent requirements.

Although fundamental provisions in the steel code are now uniformly understandable, lingering uncertainty as to proper interpretations of many details continues to hold back considerable routine business. Many obstacles that were not apparent at the inception of codification are cropping out in daily practice and sales executives believe another month is necessary for complete adjustment to the radical changes effected by the code.

Full-finished sheets and strip steel are beginning to feel the influence of the approaching lull in demand from the automotive industry, which will soon be engaged in rescheduling production for new models. Miscellaneous interest in sheets, however, is slightly improved, but the pickup is too mild to augur definite betterment in consumption.

Tin plate specifications continue in undiminished volume and operations in that branch of the industry are sustained at virtual capacity. Moderate booking of tin plate at the recently advanced quotation of \$4.65, Pittsburgh, have been entered. Bars and structural shapes are somewhat more active. The automotive industry is ordering bars more freely, while expediting of Government construction work has caused a livelier interest in structural shapes and reinforcing bars. Private structural work is also more of a feature as a result of brewery and distillery projects.

Current takings of steel by the railroads are meager, although some early purchases are in prospect. The Pennsylvania Railroad will open bids on Sept. 28 on its miscellaneous requirements and the Chesapeake & Ohio is inquiring for about 7500 tons of track accessories to supplement its recent rail order. Prospects for further important rail purchases will remain indefinite until the question of rail prices has been discussed with the Federal coordinator.

Steel ingot production in the Pittsburgh district is scheduled this week at about 32 per cent, a drop of two points since last week. Output in the Valleys and nearby northern Ohio mills is slightly higher at 48 per cent of capacity. Operations in the Wheeling district are unchanged at 75 per cent.

## Pig Iron

Shipping releases against third quarter contracts are more frequent as the final quarter approaches. Virtually no interest in forward tonnage has been manifested since books were opened for fourth quarter, and consumers continue to restrict purchases to spot carlots. Despite the advent of the final quarter, non-integrated steel makers are still out of the market, and no basic inquiries have appeared. Although no Valley basing point on low phosphorus iron is included in the code, that grade is available at \$25, f.o.b. Valley furnace.

## Semi-Finished Steel

Aggregate movement of billets, slabs and sheet bars has declined. Non-integrated mills still are not disposed to gage their forward needs and are relying mostly on their stocks of semi-finished grades. Calls for sheet bars have not let up, however, with tin plate mills still the most active takers. Demand for skelp is notably spotty. Fourth quarter prices are unchanged at \$26, Pittsburgh, Youngstown or Cleveland, on billets, slabs and sheet bars; \$35, Pittsburgh on wire rods; \$31, Pittsburgh, on forging billets.

## Bars, Plates and Shapes

Producers in this district continue to quote the 1.60c., Pittsburgh, price for fourth quarter, on plates, shapes and bars. The reported withdrawal of fourth quarter quotations by an Eastern producer has not yet established a precedent for any of the local mills. Although an upward revision in price is not considered an improbability at some future date, an immediate general advance is being discounted by the fact that strict adherence to the current base schedule, with even more rigid observation of extras under the code, represents sharp increases over the prices in circulation before Aug. 1, when generous concessions to large buyers was the rule.

A slight improvement in demand for

bars is noticeable. Motor car manufacturers are ordering more freely. Reinforcing bars projects are also more numerous. Structural steel inquiries are in greater number, but individual tonnage requirements are insignificant. About 1200 tons of structural shapes and 500 tons of reinforcing bars will be required for the Pittsburgh post office ramps. Private construction work shows slight expansion, with brewery and distillery projects predominant. Structural and bar tonnage for Government work has not yet risen to important levels, although releases on the reconstruction program are being expedited. Plates are rather neglected. Tank work is meager, and fresh barge construction is lacking. Railroad requirements still are of a minor character.

## Rails and Track Accessories

The Chesapeake & Ohio is inquiring for about 7500 tons of tie plates, spikes and bolts for delivery by Nov. 15. The Pennsylvania Railroad will open bids Sept. 28 on miscellaneous steel requirements, which will include an indefinite tonnage of track accessories. Most carriers are cleaning up old orders or are drawing from stocks. Rail makers continue to fix their attention on developments at Washington in connection with the Government proposal to sponsor rail purchases. The authorized purchase of 10,000 tons of rails by the New York Central faces deferment until the question of price has been discussed with the Federal coordinator. Some resistance to Federal suggestion that the present rail price of \$40 be revised may be encountered in view of current high production costs, but the attitude of the makers in that respect will probably hinge chiefly on the tonnage that might be offered them. Light rail quotations, as originally filed under the code, have been revised. Light billet rails are quoted at \$32, mill base, and light rails produced from rail steel are quotable at \$31, mill. For fabricating quality, an extra of \$2 a gross ton is added. Base sections are 25 to 45 lb. Under the code, makers of light rails are permitted to sell not more than 10 per cent of total production in rerolled quality as seconds at \$2 a gross ton below the base quotation.

## Wire Products

New business is very light. Several minor changes in extras are now in effect under the code, but base prices are unchanged at \$2.10, per keg, on wire nails, and 2.10c. on manufacturers' wire. Wire mesh for road construction is quiet. Agricultural demand is also sluggish. Wire mill operating schedules have been scaled down slightly and average around 60 per cent.

## Sheets

With the exception of a fair demand for wide sheets for the automotive industry, interest in most grades of

sheets has narrowed down. Interpretations of extras and other details covered in the code are still somewhat muddled, and further clarification of code provisions will be necessary before sales offices can tackle miscellaneous orders with comprehension. Backlogs now are pretty thin, and, with buyers generally hesitant about placing new business, sheet mill operations have receded to slightly less than 50 per cent of capacity. A further recession in mill activities is foreshadowed by the approach of the usual lull in buying by the automobile makers during the switch to production of new models.

### Tubular Goods

An order for 38 miles of 10 $\frac{1}{4}$ -in. o.d. line pipe, amounting to 3424 tons, was divided between two local mills by the New York State Natural Gas Co. The market for tubular goods otherwise shows few signs of life. Standard pipe is particularly quiet, while small-lot orders for boiler tubes and mechanical tubing comprise the general run of new business.

### Cold-Finished Bars

Sporadic improvement in demand is discernible. Replenishment buying by the jobbers accounts chiefly for the pick-up. Requirements of the automotive industry continue to diminish. Cold-finished bar producers have not yet established fourth quarter prices, although schedules for that period are expected to be announced this week. Meanwhile, the price is held at 1.95c., Pittsburgh, for remainder of third quarter. Ground and turned shafting is quoted at the schedules effected on Aug. 1.

### Tin Plate

Although bookings at the new price of \$4.65 per base box have been made, aggregate tonnage placed at the advanced quotation is rather insignificant. Several provisions in the code set-up on the tin plate price schedule have not been definitely clarified. The price to consumers on stock tin plate has been set at \$4.05 a box, Pittsburgh. With specifications against old contracts still unusually heavy, no interruption to current full engagement at mills is in sight. The final date for 1933 specifications is Oct. 15.

### Strip Steel

Miscellaneous demand has improved, while specifications from the motor car makers are fewer. Interest from agricultural implement manufacturers is noticeably brisk. Unfilled tonnage has been whittled down, and strip mill operations are slightly lower. Current operations average somewhat below 50 per cent of capacity. A few orders booked prior to the recent advances are still uncompleted. Some sellers are quoting 1.65c. on hot-rolled and 2.25c. on cold-rolled for remainder of third quarter, while others will quote the new prices of 1.75c. and

2.40c. respectively before the close of September. Cooperage stock is quiet and quotably unchanged at 1.75c., Pittsburgh, through the month, and 1.85c. for fourth quarter.

### Bolts, Nuts and Rivets

Current prices have been reaffirmed for a 30-day period, commencing Oct. 1. Demand is very dull. Bolts and nuts are quotably unchanged at 73 per cent off list, and large rivets at \$2.50, base per 100 lb., Pittsburgh or Cleveland.

### Coke and Coal

Cessation of operations in the Connellsville coke regions has virtually dried up all offerings of bituminous coal and furnace and foundry coke. In the absence of buying, both coke and coal quotations remain nominal, although the possibility of a prolonged strike has naturally imparted firmness to all fuel prices. Large consumers have not openly expressed concern

over the existing labor disturbances, and evidence of contingency buying is lacking. Fuel supplies, however, are generally low, and unless settlement of present disputes is effected before long, some buying in outside districts will likely be imperative.

### Scrap

A mill purchase last week of approximately 5000 tons of No. 1 heavy melting steel and rail steel has established the market at \$12.50 to \$13. No other buying of importance has appeared and the continued absence of consumers from the market has tended to soften the whole list. Practically all other grades of scrap are nominally lower at 25c. to \$1 under previous quotations. Heavy breakable cast and No. 1 cast are exceptions and are quotably unchanged at \$10.50 to \$11 and \$11.50 to \$12.00, respectively. Specialties, though scarce, are lower in sympathy with other grades.

## Valley Steel Demand Is Spotty with Ingot Production Temporarily Higher

**Y**OUNGSTOWN, Sept. 19.—Aggregate steel tonnage on producers' books at the mid-month reflected a drop of 25 to 30 per cent in comparison with the volume booked in the first half of August. The flow of business in the fore part of September was impeded partly by the deterrent influence of code complications. With practically all prices on steel products established for fourth quarter, sales offices are generally back to normalcy, although the fog of code details has not entirely evaporated. Consumers, however, continue to buy only against spot requirements, and, with backlogs at the vanishing point, producers are confronted with vague prospects for the immediate future.

Although current orders are being placed sporadically, enough fill-in tonnage has been booked to lift ingot output a few points to about 50 per cent of capacity. Non-integrated mills, whose inventories of semi-finished steel have shrunk, have accounted partly for fair tonnages of billets, slabs and sheet bars. Movement of sheet bars to tin plate mills, which continue their full engagements, has not shown signs of slackening. Sheet and strip mills are sustaining operations at close to 60 per cent of capacity, chiefly on the strength of steady demand from the automotive industry.

Pipe production has expanded, although operations are sustained largely by engagement of one mill on the recent 6000-ton order for a pipe line in Kansas. Standard butt-weld and lap-weld pipe continue quiet as a consequence of the well-bought position of jobbers who covered prior to the

last price changes. New line projects are scarce. Drilling restrictions in the oil fields continue to depress demand for oil country goods. The market for bars, plates and shapes lacks vigor. Prospects for these products, however, are brighter than they have been for many months. Federal sponsorship of credit expansion, which in time will stimulate private enterprise, and prospective railroad buying are buoying up hopes that important tonnage will reach producers of the heavier products before long. In the meantime, release of Government construction work is being expedited, although local mills have not yet enjoyed any marked benefits from that source. Miscellaneous demand from the railroads has improved. The Chesapeake & Ohio is in the market for about 7000 tons of tie plates and a tonnage of track accessories to supplement its recent purchase of rails.

Most producers of bars, plates and shapes are quoting 1.60c., Pittsburgh, for fourth quarter. Some talk persists that a higher price for that period will be effected, but revisions from the current schedule have not yet been reported as filed. Demand for wire and nails is only fair. Ingot and roll manufacturers continue to encounter meager interest in their products.

The recent labor disturbances in the western Pennsylvania coal fields have not visibly influenced fuel purchases of Valley steel makers, although in one or two cases covering in outside producing regions has been in evidence. Fuel supplies in this district are considered ample for 30 days.



# Chicago Ingot Output Rebounds Three Points



**Rail Tonnage Results in Heavier Open-  
Hearth Operations—Further Railroad  
Buying Looked For—Scrap Gives Further  
Ground**

**C**HICAGO, Sept. 19.—Elimination of the surcharge on freight rates, the prospect of railroad rail and equipment purchases, the possibility that prices will be advanced on plates, shapes and bars and an upturn in ingot output are the major topics in this market.

The surcharge will be removed on Oct. 1. The interstate switching charges at Chicago, having been advanced, have not been carrying the surcharge, but intrastate rates, which were not advanced, have the surcharge added. Anticipating the elimination of the surcharge, a move was made to obtain advances in intrastate switching rates to bring them in line with the interstate rates. These new rates were to have become effective Sept. 20, but the order has been stopped and the effective date postponed one month.

It is now considered probable that the railroads will approach mills with a rail tonnage representing the total of all their requirements and this may form the basis for requests for lower prices. Conviction also is growing that loans are to be made available so that railroads can enter the market for cars and locomotives.

The scrap market is weaker throughout its entire range and prospects for consumer purchases in the quantity that would bolster the price structure are not bright.

Impending advances on plates, shapes and bars will probably be \$2 or \$3 a ton.

The Chesapeake & Ohio rails are giving much needed support to ingot output, which has risen three points to 44 per cent of capacity. Specifications for finished steel are the best in five weeks, but the gain is small. New buying remains on the basis of actual requirements.

## Pig Iron

Shipments of Northern iron are about on a par with the movement in the first half of August. New buying, while fair, is for the most part for nearby use. Several inquiries for a thousand tons and more are before the trade. Producers are making close study of the coal industry's cost, anticipating that fuel prices will move up and that the cost of producing pig iron will accordingly advance.

## Cast Iron Pipe

Although there is moderate increase in small miscellaneous business, there is no gain in demand for large tonnages. Improvement in the market hinges on loans from the Federal Government. Several tonnages at Milwaukee are still pending for this reason. The waterworks division of the city of Chicago has no concrete plans at this time. Green Bay, Wis., will open bids Oct. 4 on a sewage disposal plant, and some fittings and castings will be required for Mississippi River dams and locks, bids on which will be taken late this month.

## Reinforcing Bars

Activity in reinforcing bars is confined mainly to road and bridge work and a few Federal Government projects. Bids will go in Sept. 20 on an addition to the Des Moines, Iowa, post office. New orders to mills are distressingly low for the reason that most contractors and some distributors bought as far ahead as possible before code prices took effect. The dealers' code, though filed, is not yet in effect. It is reported a public hearing will be held on it within the next week to ten days.

## Rails and Track Supplies

The Chesapeake & Ohio, which last week ordered over 31,000 tons of rails of which about 24,000 tons were taken by Chicago producers, has entered specifications and will take most of the tonnage in the next 60 days. Chicago mills are already busy on the orders. This railroad still has about 10,000 tons of track supplies to purchase. It is understood that the railroads of the country are to submit estimates of the rails they could use and that the total quantity will be the basis on which mills will be approached for a revision of prices. Miscellaneous orders for track supplies are lighter.

## Plates

Foremost in the minds of sellers is the prospect of large purchases of plates in the event that Government funds are used to finance railroad equipment orders. It is evident from reports received here that a survey of needed equipment is well advanced, and that a sizable buying program may be launched soon. The market continues to be featured by occasional brewery jobs with their attendant tank

needs. At the moment there is some attractive plate business in prospect for State highway bridges. Bids are due this week on the three dams across the Mississippi River, requiring in all about 10,000 tons of plates.

## Bars

There is a general disposition on the part of sellers to hold back on fourth quarter commitments at present quotations. It must be admitted that this is not a difficult thing to do in view of the lack of interest shown by consumers. However, the attitude of the mills is explained by rising costs coupled with declining volume. It is predicted in some quarters that new schedules may be filed at \$2 to \$3 a ton above present schedules. Demand for bars is relatively steady, shipments to automobile manufacturers being larger than had been expected earlier in the month. This applies to automobiles in the lower price brackets.

## Structural Material

Up until several days ago fabricators had generally agreed that the market had reached a new bottom, but suddenly State and Federal jobs started to come out and the situation has taken on a new aspect. Awards have climbed to 6000 tons, including 1000 tons in addition to the 1500 tons previously reported for the Walker distillery at Peoria, Ill. Fresh inquiries, mostly for bridge work, total close to 10,000 tons and then there are the 10,000 tons for dams across the Mississippi River, bids on which are due to go in during the next ten days. About 14,000 tons of beam piling will be required for breakwaters at Calumet and Indiana Harbor at the south end of Lake Michigan. There is a possibility that shapes, as well as plates, will be advanced in price.

## Wire Products

Demand is variable, but the aggregate tonnage from all sources remains steady, production remaining close to 50 per cent of capacity. Jobbers are still concerned with the formation of their code and their wishes have not been satisfied with regard to transportation of steel mill goods. Farmers, now busy with the tag ends of the harvest, are about ready to attend county fairs, after which they are expected to reenter the market for their needs.

## Scrap

Prices are sagging and most grades are off 50c. a ton. Consumers, having less need for scrap, must be shown lower prices. Some dealers size up the market as being no better than it was soon after the turn of the year. Many in the trade are giving more thought to stabilized prices for scrap, with quotations filed after the manner of finished steel prices. This proposal is opposed by some interests on the grounds that scrap prices are now below their intrinsic worth and that if stabilization is to come prices should first be advanced to a more equitable level.

# Slump in Demand Is Sharp in Eastern Pennsylvania



**Advances in Plates, Shapes, Bars and Pig Iron Expected in View of Rising Costs—Scrap Declines—Ingots Output Down to 35 Per Cent**

**P**HILADELPHIA, Sept. 19.—The slump in new business is disappointingly sharp. A let-down from the recent heavy buying movement at the lower prices had been anticipated, but it is more extensive than the trade had expected. It is attributed partly to the fact that consumers laid up large stocks on which they are still working. It is also evident that buyers are experiencing a recession in the demand for their own goods.

Delay in clarifying the steel code, especially as to extras and differentials, is likewise a retarding influence. This factor, however, is expected to be cleared up soon with the near approach of the fourth quarter. New prices to become effective on Oct. 1 must be filed by tomorrow, or 10 days before they become operative. On most products the fourth quarter base prices are being quoted. But makers of plates, shapes and bars are not quoting for this delivery, some having withdrawn for that period, while others had not yet named prices for the final quarter.

Reports are current that plate, shape and bar prices will be advanced. It is said that consideration is being given to a \$2 increase. It is also reported that pig iron prices may also be increased. These contemplated rises are understood to be based on higher costs that will come from operation of the new bituminous coal code.

Coupled with the price situation is concern over the labor outlook. The spread of strikes, it is realized, will inevitably be costly to industry.

The scrap market has shown further declines, covering several grades. Meanwhile open-hearth operations have again dropped, tapering off two points to 35 per cent of capacity. On the whole, this rate appears to be somewhat higher than mill operations. This is indicated by the fact that raw steel is being stocked, not heavily, but at a growing rate.

The Pennsylvania Railroad on Sept. 28 and 29 will take bids under the Clayton act for its estimated requirements for the fourth quarter. They total "not to exceed" 11,000 tons. Of this quantity 10,000 tons is made up of plates, shapes, bars, spring steel, strip, steel wheels, axles, piston heads, spikes, tie plates, joint bars and pig

iron. No specific tonnage is given for any of these items. Bids also are to be received for not more than 500 tons each of locomotive boiler tubes and sheets. For the first time bids are asked on the basis of delivered points on the Pennsylvania Railroad and they cover almost the entire system. This is in accordance with the code requirements. It is not known how much of the tonnage may be actually bought.

## Pig Iron

Buying has slowed down. Requisitions, however, are holding up fairly well. Makers say costs will be increased considerably as the result of the new coal code and that increased prices for the fourth quarter may be necessary.

## Plates, Shapes and Bars

Mills are not quoting fourth quarter prices, but with that period near at hand quotations must be filed under the code soon, possibly tomorrow. Reports are in circulation that a \$2 advance may be made. Demand is light and operations are chiefly on backlog tonnage. Unless new business is soon booked at a better rate than at present, the fourth quarter will be approached with lighter schedules.

## Sheets

Automotive buying, the chief source of sheet demand, has declined sharply. Mills, however, still are operating at a high rate on bookings which were taken in connection with the recent heavy buying movement. There is still considerable pressure for quick delivery. Fourth quarter demand is expected to pick up when automotive plants have completed designs for new models.

## Imports

The following iron and steel imports were received here last week: 27 tons of steel bars and 10 tons of steel tubes from Sweden.

## Scrap

The market is easier. Several grades have shown declines, with No. 1 heavy melting dropping to \$11 on the basis of sales the past week. No. 2 heavy melting has dropped \$1 per

ton, with a new range of \$9 to \$9.50 at which transactions have been made. Other grades that have weakened in price are blast furnace turnings, specification iron and steel pipe and steel axles. The latter showed a drop of \$1.50.

## Warehouse Business

Demand is light and prices are unchanged.

## Greater Activity in Pig Iron at St. Louis

**S**T. LOUIS, Sept. 19.—Trading in pig iron is confined to small lots for prompt shipment, but the number and aggregated tonnage of these transactions is considerably larger than during the past several weeks. Books for fourth quarter have opened, but no considerable tonnages have been closed. Shipments against prior purchases continue large. The melt holds up well, and has recently been stepped up by resumption of operations by stove plants which had closed for adjustment of labor differences under the code. Prices to apply in this district through 1933 are: No. 2 foundry \$17.50, malleable \$18, and basic \$17, f.o.b. Granite City; the delivered St. Louis price is the Granite City base figure plus the switching charge to the consuming industry. These switching charges vary from 15c. to 98c. a ton within the industrial area. The No. 2 Southern price, delivered St. Louis, is 38c. per ton below the St. Louis delivered price of Granite City iron.

Sheet and plate demand since the last week in August shows sagging tendencies, consumers being disposed to await clarification of prices and other details affected by working out of the NRA codes. Some betterment in Southern demand for galvanized sheets is noted, and tin plate is holding its own. The leading district producer of sheets has opened its books for fourth quarter and announced the following prices, delivered St. Louis: Hot-rolled No. 10, 2.09c.; hot-rolled annealed, No. 24, 2.59c.; galvanized, No. 24, 3.19c.; tin mill black, 2.84c.; tank plates, 1.89c. The only change from current quotations was an advance of \$2 per ton on hot-rolled No. 10 and a decline of \$1 per ton on tank plates.

Aside from the purchase of 2000 to 3000 tons of No. 1 railroad steel by a west side mill, dealing in scrap iron and steel is virtually at a standstill. Consumers are awaiting developments, and are for the most part well covered. Dealers are unwilling to sell at present prices. The general undertone is easier, and offerings are somewhat freer than heretofore. Railroad offerings are light, the only list being 10 carlots by Union Pacific.



# Steel Bookings Continue to Lag at New York



**No Large Bulge in Third Quarter  
Releases—Reports of Impending Re-  
duction in Rail Price Lack Verification**

**N**EW YORK, Sept. 19. — Aside from a slight bulge in sheet and strip specifications prior to the Sept. 15 deadline on third quarter contract tonnage, steel bookings have continued to lag. The month to date has been a disappointing one as compared with the three previous months and there are no indications of an early revival of demand unless it comes as a result of Government pressure. There are still hopes that action on public works projects will be speeded up. Bids have been taken on the Grand Island bridges, near Buffalo, and the fabricating contract, covering 13,000 tons, is expected to be placed shortly. Reports that negotiations are under way between Washington and the mills for a reduction of \$2 a ton on rails, as a prerequisite of Government financing of rail purchases, are apparently without foundation.

Further increases in mill costs, resulting both from a decrease in business volume and a second advance in wage rates, effective Sept. 15, have forced producers to reconsider their fourth quarter prices. Quotations on plates, shapes and bars for the fourth quarter have been withdrawn and new ones, undoubtedly carrying advances, are expected to be filed within the next few days.

New market practices as prescribed by the steel code are still the major topic of discussion among both sellers and buyers. Numerous modifications of selling terms are being proposed, with the possibility that some of them will be adopted. For example, it is now suggested that jobbers be given a discount from the code prices on plates, shapes and bars. Under present arrangements they are required to pay full base prices.

The new tin plate price of \$4.65 has been modified to the extent that large buyers are given a fixed discount as in the past. Stock tin plate will be sold at \$4.05 a base box to the general trade with a jobber differential. Since present commitments will keep tin plate mills busy until close to the end of the year, the new prices are of nominal significance for the time being.

## Pig Iron

Despite sustained pressure from furnaces, a slight slackening in ship-

ments against old contracts is noticed. In cases where all contract tonnage has been taken melters are uninclined to enter forward bookings until industrial activity warrants a more predictable casting schedule. Since foundry melt has not slackened appreciably, there is every indication that consumers must come into the market for additional supplies within the next three weeks. Bookings for the past week aggregated 1900 tons, of which about 1500 tons was for spot delivery. Purchases totaled 2300 tons a week ago, and 2200 tons was sold during the preceding period. The New York Central Railroad is inquiring for 175 tons of foundry and malleable iron for delivery to Elkhart, Ind., but additional open inquiry is negligible. It is expected that the general contract for the new Hudson River tunnel, requiring over 52,000 tons of cast iron segments, will be

## Iron and Steel Demand Lags in South

**B**IRMINGHAM, Sept. 19.—Neither pig iron nor steel is active at present and September is proving a quiet month. Pig iron shipments and steel bookings are slower than in August. Iron shipments are mostly on contracts and there is little new business, either spot or for the fourth quarter. The approach of the last quarter is not expected to provide much activity. Foundries will likely buy cautiously for awhile until the outlook is more promising. Some foundries will have sufficient iron, bought back in June and early July at \$12, to cover their needs during October. The ten-day notice of price advances, required by the code, will give time to buy iron at old prices. Furnace operations remained at eight last week, five being on foundry iron and three on basic.

## Steel

New business is limited to a small amount of light products. Demand for bars, plates and shapes is negligible. The moving of the cotton crop is expected to provide an upturn in sheets and wire products around Oct. 1. Structural steel and reinforcing bar fabricators are hopeful of better

placed this month. Previous makers of these segments have generally used iron from Bethlehem, Pa., furnaces, and if the same procedure is followed again, the heavy purchase will have little effect on the local district.

## Reinforcing Steel

Award of 250 tons of road mesh to American Steel & Wire Co., for highway construction in Wayne County, N. Y., constituted the major activity during the past week. A few minor private projects accounted for a few hundred tons. Pending awards include over 900 tons of bars for the substructures of the Grand Island bridges in Erie and Niagara counties, N. Y., and about 350 tons of mesh for highway construction in Somerset and Hunterdon counties, N. J. Contractors for New York road work will also make additional mesh awards the latter part of the week. Quotations on billet and rail steel bars are firm, and no immediate change is expected.

## Scrap

Mills in the Pittsburgh and eastern Pennsylvania areas continue to postpone shipments. Sellers are generally indisposed to shade the market despite pressure for concessions. While domestic scrap consumption has declined, export demand is still active, and the sizable movement of heavy melting grades into foreign consumption is forestalling weakness in selling prices in this district.

business with the increasing amount of road work that is being scheduled. Ingalls Iron Works has booked 150 tons of structural steel for a brewery to be built at Miami by the City Ice & Fuel Co. This will be handled by the plant at Verona, Pa. Eleven open-hearth units were worked last week.

## Pipe Lines

Independent Utilities Co., Jackson, Miss., plans steel pipe line from natural gas field near Jackson to Blue Mountain, Miss., for commercial gas supply.

Liquefied Gas Corp., Foshay Tower Building, Minneapolis, Minn., has authorized steel pipe line distributing system for service at Wisconsin Rapids, Wis. H. H. Henley is engineer.

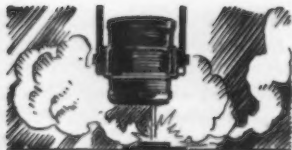
Sun Pipe Line Co., Beaumont, Tex., a subsidiary of Sun Oil Co., Philadelphia, has work under way on 6-in. steel pipe line from Conroe, Tex., oil field to Humble, Tex., about 19 miles, where connection will be made with main trunk line running to Beaumont.

Consolidated Petroleum Distributors Co., 315 Montgomery Street, San Francisco, plans steel pipe line from Kettleman Hills, Cal., oil field district to Stockton, Cal., for crude oil supply to proposed refinery at latter place. Cost about \$1,000,000.

Peoples Light Co., Davenport, Iowa, plans main trunk line and steel pipe distributing system for natural gas service in different parts of city. Cost over \$150,000. Harry E. Littig is general manager.

Eureka Gas Co., Huntington, W. Va., plans steel pipe line along Thirty-first Street and vicinity for gas supply for industrial plants.

# Bulge in Sheet and Strip Releases at Cleveland



**New Business, However, Is Lacking—Mill Backlogs Are Dwindling But Ingot Output Holds Unchanged at 45 Per Cent**

**C**LEVELAND, Sept. 19.—Mill orders for cold-rolled sheets and hot and cold-rolled strip continued heavy until the deadline for accepting specifications against third quarter contracts taken at the old prices. Otherwise the demand for finished steel has declined further. There is very little new business in any product and consumers are not showing any interest in fourth quarter contracts. Ingot output in the Cleveland-Lorain territory is unchanged this week at 45 per cent of capacity. The Otis Steel Co. put on an additional open-hearth furnace but this was offset by the taking off of a furnace by the Corrigan, McKinney Steel Co. Another blast furnace in Lorain will be blown out this week, leaving only one stack active.

Mill backlogs are dwindling. Some of the sheet mills will be about cleaned up on old orders by Oct. 1, but a few have enough tonnage on their books to carry them well into the coming month. The larger consumers, including the automotive industry, have placed orders for about all steel due them under their contracts, and some of the consumers evidently are accumulating stocks of material bought at below today's prices which will be sufficient to last them for some time.

Uncertainty as to fourth quarter prices on bars, plates and shapes has contributed to the slowing down of business. While several makers of these products announced that their present prices would prevail through the coming quarter, sales offices have not been given authority to quote for that delivery. The only new price announced during the week is the reaffirmation of present prices on bolts, nuts and rivets for October shipment only.

## Pig Iron

The limited spurt in buying for the fourth quarter has subsided. With the recent price advance many buyers feel that prices will remain at present levels through the quarter, and they will buy iron as they need it rather than place a quarterly contract. Shipments continue good, holding up to the August volume.

## Iron Ore

Consumption of Lake Superior ore during August was 2,611,903 tons as

compared with 2,626,293 tons in July, a loss of 14,390 tons. The amount consumed in July last year was 606,961 tons. Furnace stocks Sept. 1 were 25,260,351 tons and the amount at furnaces and Lake Erie docks on that day was 30,155,875 tons, a decrease of approximately 2,000,000 tons from a year ago when these stocks amounted to 32,163,651 tons. Central district furnaces in August consumed 1,602,255 tons, a gain of 1014 tons. Lake front furnaces consumed 1,004,103 tons, a loss of 19,209 tons; all-rail furnaces used 4855 tons, a gain of 3326 tons and Eastern furnaces melted 690 tons, a gain of 475 tons. There were 89 furnaces in blast using Lake ore Aug. 31, a decrease of five for the month.

## Sheets

Specifications continued heavy the past week for grades that were advanced recently. While larger consumers ordered about all of their unfilled tonnage, many of the smaller buyers failed to specify by the deadline date Sept. 15 to the full extent of their contracts. While some substantial orders have been placed by the automotive and other industries for sheets for October and November shipment, new demand is not plentiful. The refrigerator industry continues to take sheets, but little new tonnage is coming from that source. Washing machine plants are specifying freely and business from stove manufacturers is fair.

## Strip Steel

Heavy specifications for both hot and cold-rolled strip were placed by the automotive industry during the week against expiring third quarter contracts. These orders were taken for delivery subject to the mills' convenience. Little if any business has been taken at the new 1.75c., Pittsburgh, price for hot strip and 2.40c., Cleveland, for cold material.

## Bars, Plates and Shapes

Bar business is confined to small lots and leading producers are taking these orders only for shipment to Oct. 1. The new extras are being applied to this business. The 2.45c. base on alloy steel bars is unchanged except at one basing point, Bethlehem, Pa., where 2.55c. now applies. The

differential for cold-drawn alloy bars is one-half cent per pound, under the new price schedules. This differential has been three-quarters of a cent per pound.

Prospects of improved activity in the construction field are not promising. New Ohio road building projects for which bids will be taken Sept. 29 include two bridges requiring 135 tons of structural steel.

## Bolts, Nuts and Rivets

The present prices of 73 per cent off list for bolts and nuts, \$2.50 per 100 lb. for large rivets and 70, 10 and 5 per cent off list for small rivets have been reaffirmed for October shipment. Because of uncertainties regarding costs, makers departed from their usual custom of naming prices for the full quarter. Cap and set screw prices have also been reaffirmed for October shipment only.

## Scrap

The market has a weak tone in the absence of new orders and releases against held up shipments. The increased cost of handling scrap is having a tendency to check further decline in prices and quotations are unchanged. Dealers are not buying, as they have sufficient scrap to fill their shipping orders.

## New England Foundry Melt Higher

**B**OSTON, Sept. 19.—All lines of steel and iron are quiet, but sellers profess to see considerable more activity in the coming quarter. The past week was one of the duller experienced in pig iron in some time. The one bright feature is that deliveries on old contracts continue to hold up well. Prices are firmly maintained, both on domestic and foreign brands of iron. Aside from a few car lots, inquiries are lacking. It is estimated the New England melt is about 10 per cent heavier than a month ago, averaging approximately 40 per cent of rated capacity.

Generally speaking, scrap brokers' hands are tied because of the continued holding up of shipments on old contracts by eastern Pennsylvania and Pittsburgh consumers. Worcester, Mass., is taking a little material, there is a fairly good movement of chemical borings, and occasionally a car of breakable cast is sold at \$10.50 a ton, delivered eastern Pennsylvania, for which \$6 a ton on cars is paid here. A large Worcester consumer is paying \$7 a ton delivered for bundled skeleton, \$7.25 a ton delivered for automobile steel, and \$8.50 to \$9 a ton delivered for No. 1 heavy melting steel.



# Fabricated Structural Steel

## Awards Again Decline—New Projects Lower

**S**TRUCTURAL steel lettings of 6200 tons compare with 8165 tons last week and 9287 tons two weeks ago. About 3800 tons of this week's total is accounted for by bridges. The largest single booking is 1000 tons additional for the Hiram Walker distillery at Peoria, Ill., for which 1500 tons had previously been placed. New projects of 14,500 tons compare with 24,560 tons a week ago. The outstanding new job is 2500 tons for a municipal auditorium at Kansas City, Mo. Structural steel lettings for the week follow:

### NORTH ATLANTIC STATES

Everett, Mass., 275 tons, industrial alcohol plant, to New England Structural Co.

York, Pa., 160 tons, bridge over Codorus Creek, to Atlas Mfg. Co.

Rockland, Del., 195 tons, bridge for New-castle County, to Belmont Iron Works.

New York, 3200 tons, health center, to Lehigh Structural Steel Co.; previously reported awarded to McClintic-Marshall Corp.

### SOUTH AND SOUTHWEST

Monroe County, Miss., 110 tons, bridge, to Stupp Brothers Bridge & Iron Co.

Randolph County, Ark., 400 tons, bridge, at Pocahontas, to Pittsburgh-Des Moines Steel Co.

Johnson County, Ark., 120 tons, bridge, to Virginia Bridge & Iron Co., Inc.

Latimer County, Okla., 140 tons, bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

Grant County, Okla., 710 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Jacksonville, Fla., 140 tons, State highway bridge, to Ingalls Iron Works.

### CENTRAL STATES

Detroit, 325 tons, alteration to Fruehauf Trailer Co. building, to R. C. Mahon Co.

Racine, Wis., 105 tons, railroad bridge, to Hanson-Elcock Foundry Co.

Peoria, Ill., 1000 tons, additional requirements for Hiram Walker distillery, to Mississippi Valley Structural Steel Co., which has previously taken 1500 tons for this project.

Chicago, 130 tons, grain elevator, to Mississippi Valley Structural Steel Co.

Carroll County, Mo., 300 tons, bridge, to St. Joseph Structural Steel Co.

State of Iowa, 200 tons, bridges, to unnamed bidders.

State of South Dakota, 250 tons, bridge, to Pittsburgh-Des Moines Steel Co.

### WESTERN STATES

Loveland, Colo., 150 tons, bridge, to Midland Structural Steel Co.

Denver, 100 tons, gates for Boulder dam, to John W. Beam Co.

Culbertson, Mont., 950 tons, bridge, to McClintic-Marshall Co.

Marion County, Ore., 155 tons, bridge for Bureau of Public Roads, to an unnamed bidder.

Los Angeles, 280 tons, MGM studio stages, to Consolidated Steel Corp.

### NEW STRUCTURAL STEEL PROJECTS

#### NORTH ATLANTIC STATES

Saco, Me., 200 tons, State bridge.

Phillips-Gardner, Me., 100 tons, two State bridges.

Niagara Falls, N. Y., 12,000 tons, North and South Grand Island bridge for Niagara Frontier Bridge Commission; Taylor-Fichter Steel Construction Co. low bidder.

Baltimore, 240 tons, incinerator plant; general contract placed.

Vergennes, Vt., 185 tons, highway bridge over Otter Creek.

Brooklyn, 650 tons, building for Michel Brewing Co.

Brooklyn, 690 tons, building for Liberty Brewing Co.

Baltimore, 150 tons, Baltimore Distilling Co. building.

Baltimore, 225 tons, Back River sewage plant.

Pittsburgh, 1200 tons, sidewalks and ramps for post office.

### SOUTH AND SOUTHWEST

State of Tennessee, 525 tons, bridges.

State of West Virginia, 410 tons, highway bridges.

State of Arizona, 260 tons, highway bridges.

State of Arizona, 126 tons, highway project N.R.H. 98-D; bids Sept. 26.

Winfield, W. Va., 750 tons, miter gates for Winfield Lock.

State of West Virginia, 540 tons, highway bridges.

### CENTRAL STATES

Toledo, Ohio, 800 tons, factory building for Toledo Scale Co.

State of Ohio, 135 tons, bridges in Ross and Wyandotte counties; bids Sept. 29.

La Porte County, Ind., 130 tons, religious institution.

Calumet, Ill., and Indiana Harbor, Ind., 14,000 tons, beam piling for breakwaters.

Meramec River, Mo., 550 tons, piling.

Springfield, Ill., 700 tons, power house.

State of Wisconsin, 400 tons, bridges.

State of Wisconsin, 330 tons, Flambeau River bridge; bids close Sept. 26.

Green Bay, Wis., 100 tons, metropolitan sewerage system; bids close Oct. 4.

State of Iowa, 850 tons, highway bridges.

Davenport, Iowa, 300 tons, Firestone Tire & Rubber Co.

Kansas City, Mo., 2500 tons, municipal auditorium.

State of Minnesota, 200 tons, highway bridges.

### WESTERN STATES

State of California, 800 tons, bridges.

Santa Barbara, Cal., 1000 tons, pier for Pacific Western Oil Co.; Macco Construction Co., general contractor.

### FABRICATED PLATE

#### AWARDS

Covington, Ky., 105 tons, Heidelberg Brewing Co., tanks, to Stanwood Corp.

Pittsburgh, 275 tons, Pittsburgh & West Virginia Railroad, bridge plate girder span, to American Bridge Co.

San Francisco, 150 tons, city pipe line, to Western Pipe & Steel Co.

### NEW PROJECTS

Niagara Falls, N. Y., 477 tons, caisson, for Grand Island bridges, Foundation Co., general contractor.

## Bids in on Large Bridges in Buffalo District

**B**UFFALO, Sept. 19—The Lackawanna plant of the Bethlehem Steel Corp. has increased the number of its active open-hearths to nine. The Republic Steel Corp. is operating six furnaces, including a large one which makes the operation equivalent to six and one-half; the Wickwire-Spencer Steel Corp. is operating two. The Seneca sheet division of Bethlehem is running at 70 to 80 per cent of capacity.

Bids have been received at Albany for construction of the two bridges to connect Grand Island with Tonawanda and LaSalle. The Taylor-Fichter Steel Construction Co., Inc., New York, was low bidder on the steel superstructure for both bridges, at \$1,504,711.30, and Booth & Flinn of Pittsburgh were low on the two substructures at \$959,289. Proposals other than the low bid on the steel work were as follows: McClintic-Marshall Co., \$1,567,017.40; Phoenix Bridge Co., \$1,600,714; Fort Pitt Bridge Works, \$1,615,575.52; American Bridge Co., \$1,692,670.40.

Pig iron demand has eased off to some extent. No weakening of the price structure is apparent; in fact,

it is expected so develop further strength, but no large inquiries are out. Shipments against old orders are moderately good. Operations are unchanged.

### Scrap

The market is slow with very few sales. Prices are more or less nominal, with a softening influence still in effect. Dealers are expecting an inflationary move of some kind soon and are reluctant to commit themselves. A sale of railroad malleable at \$13.25 Lockport is noted, and some sales of No. 1 machinery cast have been made at \$11.50 to \$11.75. Steel plant operations are eating into present supplies of scrap and the mills are by no means oversupplied. One mill is understood to be offering \$10 and \$9 for No. 1 and No. 2 heavy melting steel respectively, but is not getting any scrap.

## Railroad Equipment

Baldwin Locomotive Works will build one 2-8-8-2 type locomotive for Weyerhaeuser Timber Co.

Stauffer Chemical Co. has ordered one 10,000-gal. insulated tank car from General American Transportation Corp.

Alaska Railroad is inquiring for 10 ballast-coal and 10 dump cars.

Texas Co. is inquiring for one 0-4-0 type switching locomotive.

United States Navy Department, Bureau of Supplies and Accounts, Washington, will take bids until Oct. 3 for 37 railway cars.

## Selling Methods Being Clarified on Coast

**S**AN FRANCISCO, Sept. 18.—Details of the steel code are being clarified with the announcement that mill quotations must be on a delivered basis. Prices are figured by adding to base quotations f.o.b. cars dock Pacific ports the all-rail rates to buyers' plants. In the local switching area 50c. per ton is added to the base for delivery. It is expected that warehouse delivered prices will be set shortly at f.o.b. warehouse plus the all-rail rate.

Bids were opened during the week on highway construction which will require 1580 tons of reinforcing steel and 2153 tons of structural steel.

Awards during the week called for only 318 tons of structural steel, 741 tons of reinforcing and 167 tons of plates. New projects requiring 1962 tons of structural steel and 608 tons of reinforcing were added to the pending list.

## Detroit Scrap Market In Further Decline

**D**ETROIT, Sept. 19.—Requests for temporary suspension of shipments on current contracts by steel mills at Cleveland and in the Youngstown district, together with the large amount of material coming out of the automobile industry, have further weakened the local scrap market. Most steel items, including heavy melting steel, hydraulic bundles and low phosphorus plate scrap, have declined 25c. a ton. The local steel plant is confining its purchases to small lots which it can acquire at low prices. The Ford Motor Co. still is selling its current production of scrap, having put out a new list for bids this week.

## Reinforcing Steel

### Awards 1700 Tons—New Projects 1100 Tons

Wayne County, N. Y., 250 tons, road mesh, to American Steel & Wire Co.

Peoria, Ill., 800 tons, brewery, to Truscon Steel Co.

San Francisco, 125 tons, Rainier Brewery building, to Pacific Coast Steel Corp.

Medical Lake, Wash., 200 tons, State hospital, to Builders Supply Co.

Los Angeles County, Cal., 324 tons, outfall tunnel at San Gabriel Dam No. 1, to Blue Diamond Corp.

### NEW REINFORCING BAR PROJECTS

Baltimore, 215 tons, incinerator plant; general contract placed.

Somerset and Hunterdon Counties, N. J., 225 tons, Road Mesh; bids Sept. 25 and Oct. 2.

Green Bay, Wis., for 210 tons, metropolitan sewage system; bids close Oct. 4.

Milwaukee, 100 tons, Government caisson plant; bids received Sept. 13 cancelled; to re-advertise on new bid forms.

Peoria, Ill., tonnage not stated, Marquette Brewing Co.

State of Arizona, 132 tons, highway project N.R.H. 98-D; bids Sept. 26.

State of Arizona, 103 tons, highway project N.R.H. 98-C; bids Sept. 26.

Monterey County, Cal., 104 tons, State highway bridge over Carmel River; bids Oct. 4.

State of California, 100 tons, highway work in six counties; bids Oct. 4.

## Cast Iron Pipe

Green Bay, Wis., will take bids Oct. 4 on a sewage disposal plant.

Mandan, N. D., plans about 18 blocks of new pipe lines for water supply. Bond issue of \$33,600 approved for this and new 1,000,000-gal. reservoir.

Vermilion, S. D., plans about 48 blocks of pipe lines for water system. Fund of \$25,000 voted.

Dallas, Tex., plans 36-in. and 30-in. trunk lines for water service. Cost about \$400,000. Financing is being arranged. John N. Eddy is city manager.

Watertown, Wis., will take bids soon for 6-in. pipe for water system. P. L. Schroeder is city engineer.

Burbank, Cal., is arranging financing for \$55,000 for installation of new water pipe line.

Colton, Cal., plans about 36,000 ft. of 6-, 8- and 10-in. pipe in connection with water and sewerage system extensions and improvements, entire project to cost \$125,000. Special election will soon be held to approve bonds. C. H. Maxwell is water superintendent.

## To Aid In Codification Of Specialty Companies

**S**OLUTION of the NRA problems of the specialty manufacturer who fits into no particular industrial classification and who, because of lack of competition in price or type of product, can be classified with no already established trade association is planned by the formation of the American Machine and Parts Association, 221 North LaSalle Street, Chicago. It is expected to handle code and other current economic problems for thousands of small factories about the country whose average personnel ranges between 100 and 150 men.

William J. Kelly, president of Arthur J. O'Leary & Son Co., Chicago, who has been chosen to head the new trade group indicates that, in general policies, it will follow the lead of the Machinery and Allied Products Institute with which it will ally itself. The code to be submitted for consideration by the members of the new American Machine and Parts Association is already in preparation and will probably be submitted to General Johnson at Washington within a few weeks.

## NRA Officials to Meet With Institute Heads

**W**ASHINGTON, Sept. 19.—Reports made to the American Iron and Steel Institute under the terms of the steel code will be gone over by officials of National Recovery Administration at a meeting with institute heads tomorrow in New York. In announcing the meeting today, the NRA said that General Johnson, Administrator, had signified his intention of attending the conference, if possible. He will be accompanied by Deputy Administrator Kenneth M. Simpson, who presided at hearings on the steel code, and Donald Richberg, general counsel of the NRA.

The announcement points out that officials of the institute have been busily engaged in working on compilation of statistics and other data for inclusion in the first formal report under the code to be submitted tomorrow. It was originally estimated that complete application of the code, including the 8-hr. day code provision, would add \$64,000,000 annually to steel payrolls. This figure, it was stated, is now regarded as too low and present estimates place the amount nearer \$100,000,000.

The announcement explains work that has been done by the institute under the code in the way of adjusting sales procedure. Changes made in extras and differentials, designation of materials by size, etc. As result, all overlapping by which a certain size formerly might be sold at one price as under a given designation and at another price under another designation has been eliminated.

Provisions of the code require that the board of directors of the institute shall afford complete access at all times to all records, statistical and other information to accredited representatives of the NRA.

Tomorrow's meetings will be followed by others at monthly intervals, at which progress "of self-determination of the industry will be examined by the National Recovery Administration." The announcement added that it is anticipated that the steel industry offers opportunities for the creation of a model organization of its kind.

Morton Manufacturing Co., Muskegon Heights, Mich., has appointed R. Lewis Giebel, 1501 Undercliff Avenue, New York, as its representative in the New York metropolitan area.

Chicago Pneumatic Tool Co., New York, has opened new branch office at 1028 Sixth Avenue South, Seattle, Wash., under management of A. M. Andresen.



# Zinc and Tin Prices Advance— Lead Position Strengthens

Copper Holds Steady at 9c. a Lb. as Codification Progresses—  
Tin Buying Is Light Despite Price Rise

NEW YORK, Sept. 19.—Quotations for electrolytic copper remain at 9c. a lb., Connecticut Valley. Offerings of secondary and speculative metal are negligible at a shaded 9c. level. Fresh buying is light, but the volume of current shipments has not declined. Many fabricators have indicated a desire for additional metal, but are not buying, despite the strength of the current market and the probability of higher quotations. Custom smelters and primary producers are expected to settle their code differences this week, and an early acceptance of the revised code is anticipated. Smelters are making strenuous efforts to prevent prices from slipping, in the belief that considerable price stiffening will follow codification.

Foreign trading in electrolytic has been quiet all week, although offerings rose 25 points on sterling strength.

Scattered bookings were recorded early today on a representative first call listing of 8.25c. a lb., c.i.f. usual Continental ports. Attempts were made to force quotations higher, but consumer reaction was unsatisfactory. The London market has lately become somewhat divorced from the domestic situation, and it seems to react more to the Continental statistical position than to conditions here.

## Tin

Quotations on Straits and English refined rose steadily during the week as the dollar declined in London. With sterling selling at \$4.79½ late this afternoon, spot Straits was available at 47.95c. a lb., New York. Consumers are generally discouraged by the rapidly rising market, and buying for future requirements has disappeared. Contracts made during the low-price May and June periods are

being drawn upon, and there is no immediate necessity on the part of major consumers to make additional commitments. In addition, stocks in official reporting warehouses rose 1000 tons to 2256 tons, which, together with the estimated large supplies in railroad storerooms and mill stock-houses, obviates any danger of a tin shortage. London prices declined to £216 5s. for spot and future standard, and £216 5s. for spot Straits. The Far East posting dropped to £223. Shipments of English refined from Liverpool to American ports totaled 1750 tons during the past week. This was the heaviest import recorded for a considerable period, and, as a consequence, United Kingdom stocks dropped 1250 tons to a current standing of 15,180 tons.

## Zinc

Faced with labor hazards and ore shortage, first hands yesterday raised asking prices to 4.75c. a lb., East St. Louis. Scattered sales were made today, and the market was considered strong at the 4.75c. figure. Late last week producers had made tentative attempts to advance quotations above 4.65c., but buyers were not particularly anxious for metal and generally ignored the action. Bookings last week aggregated over 3000 tons, the bulk of which was at 4.65c. Only one sale was below that figure, and a few scattered contracts were made at slightly higher prices. Prime Western continues to sell for \$31 a ton, but smelters are unable to secure satisfactory bookings. Joplin mines are attempting to allocate output, and if definite action is taken, it would probably be reflected immediately in quotations for refined metal.

## Lead

The active entrance of corrodors into the current market has bolstered daily sales, and bookings generally are well above daily intake. September is covered but October requirements are practically unsold. Shipments are well ahead of schedule, and the trade expects forthcoming reports to indicate further improved statistical position. Current prices are unchanged but strong at 4.50c. a lb., New York, and 4.35c., St. Louis. The continued weakness of the dollar on the London exchange has resulted in a declining parity for foreign bullion. Although pig lead from Spain and Australia has never been a serious threat to the domestic structure, it has, nevertheless, exerted a sympathetic negative pressure against domestic price advances. If the potential threat of importation continues to recede and the domestic demand is sufficiently protracted to warrant stronger action, it is expected that 4.75c. metal will soon appear. London offerings are firm, but Continental consumer interest continues light.

The Week's Prices. Cents Per Pound for Early Delivery

	Sept. 13	Sept. 14	Sept. 15	Sept. 16	Sept. 18	Sept. 19
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, New York	9.00	9.00	9.00	9.00	9.00	9.00
Straits tin, Spot, N. Y.	45.70	46.35	46.80	47.87½	47.95	47.95
Zinc, East St. Louis	4.65	4.65	4.65	4.75	4.75	4.75
Zinc, New York	5.02	5.02	5.02	5.12	5.12	5.12
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

\*Refinery quotations; price ¼c. higher delivered in Connecticut.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.  
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.  
Antimony, 6.75c. a lb., New York.  
Brass ingots, 85-5-5-5, 9c. a lb., New York and Philadelphia.

### From New York Warehouse

#### Delivered Prices, Base per Lb.

Tin, Straits pig	49.25c. to 50.25c.
Tin, bar	51.25c. to 52.25c.
Copper, Lake	10.50c. to 11.25c.
Copper, electrolytic	10.25c. to 10.75c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	17.12½c.
*High brass sheets	14.75c.
*Seamless brass tubes	16.37½c.
*Seamless copper tubes	16.62½c.
*Brass rods	12.25c.
Zinc, slabs	6.00c. to 7.00c.
Zinc sheets (No. 9), casks	9.75c. to 10.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	7.00c. to 8.00c.
Lead, sheets	8.25c.
Antimony, Asiatic	8.50c. to 9.50c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ¾	30.00c. to 31.00c.
Babbitt metal commercial grade	25.00c. to 50.00c.

\*These prices are also for delivery from Chicago and Cleveland warehouses.

### From Cleveland Warehouse

#### Delivered Prices per Lb.

Tin, Straits pig	48.12½c.
Tin, bar	50.12½c.

Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, casting	10.00c.
Zinc, slab	6.00c. to 6.25c.
Lead, American pig	5.35½c. to 5.50c.
Lead, bar	8.50c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	52.12½c.
Solder, ½ and ¾	28.25c.

### Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.00c.	8.00c.
Copper, hvy. and wire	6.75c.	7.75c.
Copper, light and bottoms	5.75c.	6.25c.
Brass, heavy	3.75c.	4.50c.
Brass, light	3.50c.	3.75c.
Hvy. machine composition	5.25c.	6.00c.
No. 1 yel. brass turnings	5.00c.	5.625c.
No. 1 red brass or compos. turnings	5.00c.	5.50c.
Lead, heavy	3.50c.	3.875c.
Zinc	2.75c.	3.00c.
Cast aluminum	7.50c.	8.75c.
Sheet aluminum	11.50c.	13.00c.

# Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

## BARS, PLATES, SHAPES

Iron and Steel Bars	
Soft Steel	
Base per Lb.	
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago or Gary	1.65c.
Del'd Philadelphia	1.91c.
Del'd New York	1.95c.
F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.79c.
F.o.b. Birmingham	1.75c.
F.o.b. cars dock Pacific ports	2.15c.

Billet Steel Reinforcing	
(Stock lengths as quoted by distributors)	
F.o.b. P'gh mills	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.85c.
F.o.b. Cleveland	1.85c.
F.o.b. Youngstown	1.85c.
F.o.b. Chicago or Gary	1.85c.
F.o.b. cars dock Pacific ports	2.35c.

Rail Steel	
(quoted by distributors)	
F.o.b. Pittsburgh	1.75c.
F.o.b. Cleveland (quoted by distributors)	1.80c.
F.o.b. Cleveland (to manufacturers)	1.55c.
F.o.b. Chicago (to merchant trade)	1.55c.
F.o.b. Chicago (quoted by distributors)	1.80c.

Iron	
Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.85c.
Common iron, del'd New York	1.90c.

Steel Car Axles	
F.o.b. Pittsburgh	2.50c.
F.o.b. Chicago	2.50c.

Tank Plates	
Base per Lb.	
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.65c.
F.o.b. Gary	1.65c.
F.o.b. Birmingham	1.75c.
Del'd Cleveland	1.805c.
Del'd Philadelphia	1.795c.
F.o.b. Coatsville	1.79c.
F.o.b. Sparrows Point	1.79c.
Del'd New York	1.888c.
F.o.b. dock cars Pacific ports	2.15c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates	
F.o.b. Pittsburgh	3.10c.
F.o.b. Chicago	3.15c.

Structural Shapes	
Base per Lb.	
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.65c.
F.o.b. Birmingham	1.75c.
F.o.b. Buffalo	1.79c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.805c.
Del'd Philadelphia	1.8155c.
Del'd New York	1.86775c.
F.o.b. dock cars Pacific ports (standard)	2.15c.
F.o.b. dock cars Pacific ports (wide flange)	2.25c.

Steel Sheet Piling	
Base per Lb.	
F.o.b. Pittsburgh	1.60c.
F.o.b. Chicago mill	2.00c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars	
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.	
Open-hearth grade, base .245c. a lb. except at Bethlehem where the price is 2.55c.	
S.A.E. Series	
Numbers	Differential per 100 Lb.
2000 (1/4% Nickel)	\$6.25
2100 (2 1/4% Nickel)	0.95
2300 (3 1/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.35
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Cold Finished Bars*	
Bars, f.o.b. Pittsburgh Mill	1.95c.
Bars, f.o.b. Chicago	2c.
Bars, Cleveland	2c.
Bars, Buffalo	2.15c.
Bars, Detroit	2.15c.
Bars, eastern Michigan	2.20c.
Shafting, ground, f.o.b. mill	1 1/4 in. 3.25c.
	1-3/16 to 1 1/2 in. 2.75c.
	1-9/16 to 1 3/4 in. 2.60c.
	1-15/16 to 2 1/4 in. 2.45c.
	2-15/16 to 6 in. 2.30c.

\* In quantities of 10,000 to 19,999 lb.

## SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets	
Hot Rolled	
No. 10, f.o.b. Pittsburgh	1.65c. to 1.75c.
No. 10, f.o.b. Gary	1.75c. to 1.85c.
No. 10, del'd Phila.	1.96c. to 2.06c.
No. 10, f.o.b. Birmingham	1.80c. to 1.90c.
No. 10, f.o.b. dock cars Pacific ports	2.42 1/2c.

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.25c.
No. 24, f.o.b. Gary	2.35c.
No. 24, del'd Philadelphia	2.56c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, f.o.b. dock cars Pacific ports	2.95c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pitt'sh	2.80c.
No. 10 gage, f.o.b. Gary	2.40c.
No. 10 gage, del'd Phila.	2.61c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.00c.

Light Cold-Rolled	
No. 20 gage, f.o.b. Pitt'sh	2.75c.
No. 20 gage, f.o.b. Gary	2.85c.
No. 20 gage, del'd Phila.	3.06c.
No. 20 gage, f.o.b. dock cars Pacific ports	4.45c.

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Gary	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, f.o.b. dock cars Pacific ports	3.55c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terme	
No. 24, unassorted, 8-lb. coating f.o.b. Pittsburgh	2.90c.

Vitroous Enameling Steel	
No. 20, f.o.b. Pittsburgh	2.90c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.56c.
No. 28, Gary	2.60c.

Tin Plate	
Base per Box	
Standard cokes, f.o.b. P'gh district mill	\$4.65
Standard cokes, f.o.b. Gary	4.75

Terne Plate	
(F.o.b. Pittsburgh)	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$8.70
15-lb. coating I.C.	11.00
20-lb. coating I.C.	11.00
25-lb. coating I.C.	12.00
30-lb. coating I.C.	13.80
40-lb. coating I.C.	15.30

## Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

Base per Lb.	
All widths up to 24 in., Pittsburgh	1.65c. to 1.75c.
All widths up to 24 in., Chicago	1.75c. to 1.85c.
Cooperage stock, Pittsburgh	1.75c. to 1.85c.
Cooperage stock, Chicago	1.85c. to 1.95c.

Cold-Rolled Strips	
F.o.b. Pittsburgh	2.25c. to 2.40c.
F.o.b. Cleveland	2.25c. to 2.40c.
Del'd Chicago	2.55c. to 2.70c.
F.o.b. Worcester	2.45c. to 2.60c.

Fender Stock	
No. 20, Pittsburgh or Cleveland	2.95c. to 3.10c.

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)	
To Manufacturing Trade	
Per Lb.	
Bright wire	2.10c.
Spring wire	3.10c.

## To Jobbing Trade

Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments.

Base per Keg	
Standard wire nails	\$2.10
Smoothed coated nails	2.10
Galvanized nails	2.40

Base per 100 Lb.	
Smooth annealed wire	\$2.25
Smooth galvanized wire	2.60
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Woven wire fence, base column	55.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.

## STEEL AND WROUGHT PIPE AND TUBING

Welded Pipe	
Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio Mills	

Butt Weld	
Steel	
Inches	Black Galv.
1/4	51 1/2
3/8	57 3/8
1/2	62 5/16
3/4	65 5/16
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# IF — MACHINE TOOLS

*Wore  
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**Bullard Single Spindle Automatic Vertical Lathe would be the Executive who governs Reduction of your manufacturing costs.**

**It's like your Mr. Executive or Mr. General Manager — a leading factor in carrying out Efficiency and NRA programs.**

**Efficiency, Versatility, and Simplicity within this machine enables manufacturers to aid NRA in re-employment and at the same time affords the means for balanced operating costs with a fair margin of Profit.**

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Cleveland,  
rows Point,  
Gross Fee  
...\$26.00

n, Chicago,  
Sparrow  
Per Lb.  
... 1.00  
... 1.00  
... 1.00

Wire Rods	
(Common soft, base)	
Pittsburgh	.....\$35.00
Cleveland	.....35.00
Chicago	.....36.00
Birmingham	.....38.00
Youngstown (del'd)	.....36.00

ALLOY STEEL INGOTS	
F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.	
Base price, \$49 a gross ton except at Bethlehem, where it is \$51.	

COKE, COAL AND FUEL OIL	
Coke	
Furnace, f.o.b. Connellsville	
Prompt	.....\$2.50 to \$2.75
Foundry, f.o.b. Connellsville	.....3.25 to 4.50
Prompt	.....3.25 to 4.50
Foundry, by-product, Chicago ovens, for delivery outside switching districts	.....3.00
Foundry, by-product, delivered in Chicago switching district	.....3.75
Foundry, by-product, New England, delivered	.....10.50
Foundry, by-product, Newark or Jersey City, del'd	.....8.20 to 8.81
Foundry, by-product, Philadelphia	.....8.50
Foundry, by-product, Cleveland, delivered	.....2.76
Foundry, Birmingham	.....5.00
Foundry, by-product, St. Louis, f.o.b. ovens	.....3.00
Foundry, by-product, del'd St. Louis	.....9.00

Coal (Nominal)	
Per Net Ton	
Mine run steam coal, f.o.b. W. Pa. mines	.....\$1.50 to \$2.00
Mine run coking coal f.o.b. W. Pa.	.....1.75 to 2.25
Gas coal, 4-in., f.o.b. Pa. mines	.....2.00 to 2.50
Mine run gas coal, f.o.b. Pa. mines	.....2.00 to 2.35
Steam slack, f.o.b. W. Pa. mines	.....85c. to 1.00
Gas slack, f.o.b. W. Pa. mines	.....1.00 to 1.25

Fuel Oil	
Per Gal. f.o.b. Bayonne, N. J.	
No. 3 distillate	.....4.00c.
No. 4 industrial	.....3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	.....4.00c.
No. 4 industrial	.....3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	.....3.78c.
No. 5 industrial fuel oil	.....3.23c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	.....5.50c.
No. 4 industrial	.....5.00c.

REFRACTORIES	
Fire Clay Brick	
Per 1000 f.o.b. Works	
High-heat Intermediate Duty Brick	.....\$45.00
Duty Brick	.....40.00
Pennsylvania	.....45.00
Maryland	.....45.00
New Jersey	.....45.00
Ohio	.....45.00
Kentucky	.....45.00
Missouri	.....45.00
Illinois	.....45.00
Ground fire clay, per ton	.....7.00

Chrome Brick	
Per Net Ton	
Standard size	.....\$45.00

Silica Brick	
Per 1000 f.o.b. Works	
Pennsylvania	.....\$45.00
Chicago	.....54.00
Birmingham	.....55.00
Silica clay, per ton	.....8.00

Magnesite Brick	
Per Net Ton	
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	.....\$65.00
Unburned, f.o.b. Baltimore	.....52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	.....40.00
Domestic, f.o.b. Chewelah, Wash.	.....22.00

CAST IRON PIPE	
Per Net Ton	
6-in. and larger, del'd Chicago	.....\$43.40 to \$44.40
4-in., del'd Chicago	.....46.40 to 47.40
6-in. and larger, del'd New York	.....38.30
4-in., del'd New York	.....41.30
6-in. and larger, Birmingham	.....\$35.00 to 36.00
4-in., Birmingham	.....38.00 to 39.00
Class "A" and gas pipe, \$3 extra.	

## Pig Iron, Ores, Ferroalloys

Pig Iron				
PRICES PER GROSS TON AT BASING POINTS				
Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.00	\$18.50	\$17.50	\$19.00
Bethlehem, Pa.	17.50	18.00	17.00	18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Cleveland	17.50	18.00	16.50	18.50
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.00
Duluth, Minn.	18.00	18.00	17.50	18.50
Birmingham	13.50	.....	12.50	.....
Provo, Utah	16.50	.....	.....	.....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS				
	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston and nearby New England				
From Everett, Mass.	\$19.00	\$19.50	\$18.50	\$20.00
From Buffalo	19.00	19.50	18.50	20.00
From Alabama	18.62	19.12	18.12	19.62
Brooklyn	19.00	20.40	19.40	20.90
From East. Pa. or Buffalo	19.00	20.40	19.40	20.90
Eastern New Jersey	19.02	19.52	18.52	20.02
From East. Pa. or Buffalo	19.02	19.52	18.52	20.02
Philadelphia	18.34	18.84	17.84	19.34
Cincinnati	18.61	18.61	18.11	19.11
From Hamilton, Ohio	18.23	.....	17.23	.....
Cleveland	18.18	.....	.....	.....
From the South	18.18	.....	.....	.....
Chicago	17.74	.....	.....	.....
From the South	.....	.....	.....	.....
St. Louis	.....	.....	.....	.....
From the South (delivered prices are uniformly quoted at 38c. a ton less than delivered prices from Granite City, the switching charges from the latter point ranging from 56c. to 75c. a ton).	.....	.....	.....	.....

LOW PHOSPHORUS PIG IRON	
Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	
Johnson City, Tenn.	.....\$22.00
F.o.b. Valley furnace	.....22.00
Del'd Chicago	.....27.65

GRAY FORGE PIG IRON	
Valley furnace	.....\$17.50

CHARCOAL PIG IRON	
Lake Superior furnace	.....\$20.50
Delivered Chicago	.....23.67
Delivered Buffalo	.....23.91

CANADA Pig Iron	
Per gross ton:	
Delivered Toronto	.....\$21.00
No. 1 fdy., sil. 2.25 to 2.75	.....20.50
No. 2 fdy., sil. 1.75 to 2.75	.....21.00
Malleable	.....21.00
Delivered Montreal	.....\$22.50
No. 1 fdy., sil. 2.25 to 2.75	.....22.50
No. 2 fdy., sil. 1.75 to 2.25	.....22.00
Malleable	.....22.50
Basic	.....22.00

Ferromanganese	
Per Gross Ton	
Domestic, 80%, seaboard, (carloads)	.....\$82.00
Domestic, 80%, seaboard, (less carloads)	.....89.00

Spiegeleisen	
Per Gross Ton Furnace	
Domestic, 19 to 21%	.....\$37.00

Electric Ferrosilicon	
Per Gross Ton Delivered	
50% (carloads)	.....\$74.50
50% (less carloads)	.....82.00
75% (carloads)	.....120.00
75% (less carloads)	.....130.00
14% to 16% (f.o.b.) Welland, Ont. (in carloads)	.....31.00
14% to 16% (less carloads)	.....36.00

Silvery Iron	
F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
6% .....\$22.25	12% .....\$29.25
7% .....23.25	13% .....30.75
8% .....24.25	14% .....32.25
9% .....25.25	15% .....33.75
10% .....26.25	16% .....35.25
11% .....27.75	17% .....36.75

Bessemer Ferrosilicon	
F.o.b. Jackson, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
10% .....\$27.25	14% .....\$33.25
11% .....28.75	15% .....34.75
12% .....30.25	16% .....36.25
13% .....31.75	17% .....37.75

Manganese 1 1/2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Other Ferroalloys	
Ferrotungsten, per lb. wo. del., carloads	.....94c.
Ferrotungsten, less carloads	.....\$1.00
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	.....9.50c.
Ferrocromium, 2% carbon	.....16.50c. to 17.00c.
Ferrocromium, 1% carbon	.....17.50c. to 18.00c.
Ferrocromium, 0.10%	.....19.50c. to 20.00c.
Ferrocromium, 0.06% carbon	.....20.00c. to 20.50c.

PITTSBURGH	
Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	.....\$12.50 to \$13.00
No. 2 heavy melting steel	.....11.00 to 11.50
No. 2 railroad wrought	.....12.50 to 13.00
Scrap rails	.....12.50 to 13.00
Rails 3 ft. and under	.....15.00 to 15.50
Sheet car crops, ordinary	.....13.00 to 13.50
Compressed sheet steel	.....12.50 to 13.00
Hand bundled sheet steel	.....11.50 to 12.00
Hy. steel axle turnings	.....11.00 to 11.50
Machine shop turnings	.....9.75 to 10.25
Short shov. steel turnings	.....9.75 to 10.25
Short mixed borings and turnings	.....8.50 to 9.00
Cast iron borings	.....8.50 to 9.00
Cast iron carwheels	.....12.00 to 12.50
Heavy breakable cast	.....10.50 to 11.00
No. 1 cast	.....11.50 to 12.00
Railr. knuckles and couplers	.....14.00 to 14.50
Rail. coil and leaf springs	.....14.00 to 14.50
Roller steel wheels	.....14.00 to 14.50
Low phos. billet crops	.....15.50 to 16.00
Low phos. sheet bar crops	.....15.00 to 15.50
Low phos. plate scrap	.....14.50 to 15.00
Low phos. punchings	.....15.00 to 15.50
Steel car axles	.....15.00 to 15.50

CHICAGO	
Delivered Chicago district consumers:	
Per Gross Ton	
Heavy melting steel	.....\$9.50 to \$10.00
Shoveling steel	.....9.50 to 10.00

Ferrovanadium, del., per lb. contained V.....	\$2.60 to 2.80
Ferrocobaltitum, 15 to 18% per net ton, f.o.b. furnace in carloads	.....160.00
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage	.....50.00
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	.....65.00
Ferromolybdenum, per lb. Mo., del.	.....95c.
Calcium molybdate, per lb. Mo., del.	.....80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	.....\$36.00
Ton lots or less, per ton	.....41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	.....85.00
3% carbon grade	.....90.00
1% carbon grade	.....100.00
Spot prices	.....\$5 a ton higher

Ores	
Lake Superior Ores, Delivered Lower Lake Ports	
Old range, Bessemer, 51.5% iron	.....\$4.80
Old range, non-Bessemer, 51.50% iron	.....4.65
Mesabi Bessemer, 51.50% iron	.....4.65
Mesabi non-Bessemer, 51.50% iron	.....4.50
High phosphorus, 51.50% iron	.....4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore	
Per Unit	
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	.....8c.
Iron, low phos., Swedish, average 64 1/2% iron	.....8.50c.
Iron, basic or foundry, Swedish, average, 65% iron	.....8c.
Iron, basic or foundry, Russian, aver. 65% iron (nom.)	.....8c.
Manganese, Caucasian, washed 52% 48%	.....23c.
Manganese, African, Indian, 44-48%	.....20c.
Manganese, African, Indian, 49-51%	.....21c.
Manganese, Brazilian, 46 to 48 1/2%	.....17c.
Per Net Ton Unit	
Tungsten, Chinese wolframite, duty paid*	.....\$12.00
Tungsten, domestic scheelite*	.....\$11.00 to \$12.00
Per Gross Ton	
Chrome, 45%, Cr2O3, crude, c.i.f. Atlantic seaboard	.....16.00
Chrome, 48%, Cr2O3, c.i.f. Atlantic seaboard	.....18.00

\*Quotations nominal in absence of sales.

Fluorspar	
Per Net Ton	
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines	.....\$15.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	.....16.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	.....17.00
Domestic, No. 1 ground bulk, 85 to 95% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	.....30.00

## Iron and Steel Scrap

Hydraulic comp. sheets	.....\$8.00 to \$8.50
Drop forge flashings	.....7.50 to 8.00
No. 1 busheling	.....8.00 to 8.50
Roller carwheels	.....11.00 to 11.50
Railroad tires	.....10.75 to 11.25
Railroad leaf springs	.....11.00 to 11.50
Axle turnings	.....8.00 to 8.50
Steel couplers and knuckles	.....10.50 to 11.00
Coil springs	.....11.00 to 11.50
Axle turnings (elec. fur.)	.....8.00 to 8.50
Low phos. punchings	.....11.50 to 12.00
Low phos. plates, 12 in. and under	.....11.50 to 12.00
Cast iron borings	.....6.00 to 6.50
Short shoveling turnings	.....6.00 to 6.50
Machine shop turnings	.....5.50 to 6.00
Revolving rails	.....11.00 to 11.50
Steel rails, less than 3 ft.	.....11.50 to 12.00
Steel rails, less than 2 ft.	.....12.00 to 12.50
Angle bars, steel	.....10.50 to 11.00
Cast iron carwheels	.....10.00 to 10.50
Railroad malleable	.....9.50 to 10.00
Agricultural malleable	.....8.00 to 8.50

Per Net Ton	
Iron car axles	.....\$12.50 to \$13.00
Steel car axles	.....11.00 to 11.50
No. 1 railroad wrought	.....8.50 to 9.00
No. 2 railroad wrought	.....8.50 to 9.00

(Continued on page 52)



## Large Sheet Bookings in Cincinnati District

CINCINNATI, Sept. 19.—Heavy specifications on contracts prior to Sept. 15, the dead line on pre-code contracts, together with some fourth quarter sales, have increased sheet business to the highest level of the year. District mill operations are to be maintained at about 70 per cent of capacity, although recent releases were sufficient to support 85 per cent output. Increased forward buying is attributed to the dissipation of price uncertainties. Automotive demand for new models is better, while general bookings are being sustained at good rate.

### Pig Iron

In the pig iron market virtually no fourth quarter inquiry or commitments have developed. Bookings of the week, which totaled about 300 tons, were all for spot shipment. It is obvious that a number of consumers covered in anticipation of price increases under the NRA and that they are now carrying fairly large inventories of pig iron. Furnace interests are insisting that commitments made before price changes be fulfilled and this is sustaining shipments at a good level. Foundries have slowed up production, but prospects continue to be good.

### Coke

Shipments of foundry coke have slackened in response to a lighter melt.

### Scrap

The supply of scrap continues to be restricted since holders of yard inventories are waiting for better prices. Dealers' bids are unchanged in a quiet market. Some movement of scrap on contract is reported, but sales are limited to occasional carload orders.

## Mining Industry Remains Active in Canada

TORONTO, ONT., Sept. 19.—While the Canadian iron and steel industry is maintaining its recent rate of operations, there has been no general improvement in business. No future delivery contracts have been closed and no inquiries are out indicating an early change in buying policy. The mining industry continues to furnish a good demand for machinery, tools and equipment and several companies recently have announced plans for mill installation and the purchase of other equipment. The automotive industry is active, but most other branches report little in the way of new business.

Merchant pig iron sales have shown some improvement, but no large ton-

nages have been booked. Prices are firm but unchanged.

Scrap business is tapering off, largely because of a drop in export demand. While shipments of steel scrap are being made from Montreal to Europe, the close of navigation will bring this business to an end. Domestic demand for steel grades is stagnant. Prices are unchanged.

## Invisible Oxide Film

(Concluded from Page 12)

was striking, for specimens so exposed remained bright indefinitely, while copious rusting occurred on those immediately outside. On the other hand, copper specimens inside the cage continued to tarnish, although at a rather lower rate, as would be expected. The phenomenon was confirmed by drawing filtered and unfiltered air at equal rates over specimens in glass tubes; the rusting of iron was inhibited while the tarnishing of copper was unaffected. Atmospheric rusting of iron differs from tarnishing, which depends entirely upon a metal-gas reaction.

Experiments have pointed to ammonium sulphate as the most active constituent of the suspended matter. It is probable that this substance plays an important part in the atmospheric rusting of iron, although at the seaboard chloride may be expected to enter.

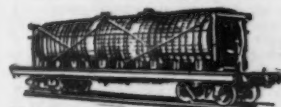
To demonstrate the formation of invisible protective oxide films on iron, specimens of iron that were screened behind muslin for several months without visible change remained bright for several weeks on subsequent normal exposure, during which time freshly cleaned specimens rusted appreciably. Subsequently the protective film on the preexposed specimens broke down at a number of points, which were more sparsely distributed but apparently gave rise to more intense action than the points of breakdown on ordinary specimens.

In the absence of the continuous "primary" film, formation of secondary rust takes place readily, at humidities considerably below the dew point, through the settling of rust nuclei from the air; these consist of (normally invisible) hygroscopic particles, of which ammonium sulphate is probably the most active constituent under ordinary conditions, away from the seaboard.

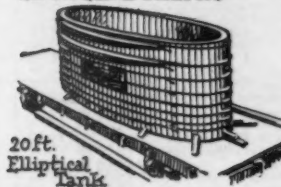
Independently of the structure of the product, the rusting of iron below the dew point involves two distinct phenomena, according as the relative humidity is below or above a critical value in the neighborhood of 65 per cent. Below the critical humidity, rusting falls off with time as the available metallic surface is used up, only to undergo an enormous acceleration when once the critical humidity is exceeded.



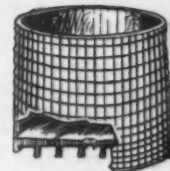
Rubber Lined Storage Tanks



Rubber Lined Tank Car



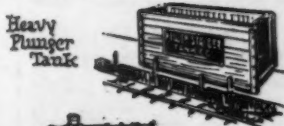
20ft. Elliptical Tank



Concave Bottom Tank



Rectangular Tank with Water Tight Compartments



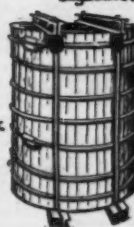
Heavy Plunger Tank



Tank Equipped with Self-Contained Agitator



Pressure Tank



40000 Gallon Sprinkler Tank

## Wooden Tanks Rubber Lined Tanks (WOOD OR STEEL)

for all Industrial Purposes

THE HAUSER-STANDER TANK CO.  
CINCINNATI, OHIO

No. 2 busheling	\$4.00 to \$4.50
Locomotive tires, smooth	9.00 to 9.50
Pipe and flues	4.75 to 5.25
No. 1 machinery cast	10.00 to 10.50
Clean automobile cast	10.00 to 10.50
No. 1 railroad cast	9.50 to 10.00
No. 1 agricultural cast	8.75 to 9.25
Stove plate	7.00 to 7.50
Grate bars	6.75 to 7.25
Brake shoes	8.75 to 9.25

#### PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.00
No. 2 heavy melting steel	\$9.00 to 9.50
No. 1 railroad wrought	12.00
Bundled sheets	8.50 to 9.00
Hydraulic compressed, new	10.50 to 11.00
Hydraulic compressed, old	8.50 to 9.00
Machine shop turnings	8.00
Heavy axle turnings	10.00 to 10.50
Cast borings	7.00
Heavy breakable cast	10.00 to 10.50
Stove plate (steel works)	9.50
No. 1 low phos. heavy	15.00
Couplers and knuckles	10.50
Roller steel wheels	14.00
No. 1 blast furnace	6.00 to 6.50
Spec. iron and steel pipe	10.00
Shafting	15.00 to 15.50
Steel axles	13.50 to 14.00
No. 1 forges	10.50
Cast iron car wheels	12.50 to 13.00
No. 1 cast	12.00 to 13.00
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

#### CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$10.50 to \$11.00
No. 2 heavy melting steel	10.25 to 10.75
Compressed sheet steel	9.50 to 10.00
Light bundled sheet stamp-	
ings	6.50 to 7.00
Drop forge flashings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Short shoveling turnings	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
Steel axle turnings	7.50 to 8.00
Low phos. billet crops	12.50 to 13.00
Cast iron borings	7.50 to 8.00
Mixed borings and short	
turnings	7.50 to 8.00
No. 2 busheling	7.25 to 7.75
No. 1 cast	11.00 to 11.50
Railroad grate bars	6.50 to 7.00
Stove plate	7.50 to 8.00
Rails under 3 ft.	10.00 to 10.50
Rails for rolling	10.50 to 11.00
Railroad malleable	10.00 to 10.50
Cast iron car wheels	11.00

#### BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$10.50
No. 2 heavy melting scrap	10.00
Scrap rails	\$8.75 to 9.25
New hydraulic comp. sheets	10.00
Old hydraulic comp. sheets	8.50
Drop forge flashings	10.00
No. 1 busheling	10.00
Hvy. steel axle turnings	8.50 to 9.00
Machine shop turnings	6.50 to 7.00
Knuckles and couplers	11.50 to 12.00
Coil and leaf springs	11.50 to 12.00
Roller steel wheels	11.50 to 12.00
Low phos. billet crops	12.50 to 13.00
Short shov. steel turnings	7.00 to 7.50
Short mixed borings and	
turnings	7.00 to 7.50
Cast iron borings	6.50 to 7.00
No. 2 busheling	6.00 to 6.50
Steel car axles	11.00 to 12.00
Iron axles	11.00 to 12.00
No. 1 machinery cast	11.25 to 12.25
No. 1 cupola cast	11.00 to 12.00
Stove plate	8.75 to 9.25
Steel rails, 3 ft. and under	13.50 to 14.00
Cast iron car wheels	10.50 to 11.00
Industrial malleable	11.50 to 12.00
Railroad malleable	12.00 to 12.50
Chemical borings	9.00 to 10.00

#### BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00 to \$10.50
Scrap steel rails	10.00
Short shoveling turnings	5.50
Stove plate	7.00 to 7.50
Steel axles	11.00 to 11.50
Iron axles	11.00 to 11.50
No. 1 railroad wrought	7.00 to 7.50
Rails for rolling	7.00 to 7.50
No. 1 cast	9.50 to 10.00
Tramcar wheels	9.50 to 10.00
Cast iron borings, chem.	8.00

#### ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$10.00 to \$10.50
No. 1 heavy melting	9.00 to 9.50
No. 2 heavy melting	8.25 to 8.75
No. 1 locomotive tires	8.50 to 9.00
Misc stand-sec. rails	10.00 to 10.50
Railroad springs	10.00 to 10.50
Bundled sheets	8.00 to 8.50
No. 2 railroad wrought	8.75 to 9.25
No. 1 busheling	8.50 to 9.00
Cast iron borings and	
shoveling turnings	4.75 to 5.25
Rails for rolling	10.50 to 11.00
Machine shop turnings	4.50 to 5.00
Heavy turnings	5.50 to 6.00
Steel car axles	11.50 to 12.00
Iron car axles	12.50 to 13.00
Wrot. iron bars and trans.	9.50 to 10.00
No. 1 railroad wrought	7.00 to 7.50
Steel rails less than 3 ft.	11.50 to 12.00
Steel angle bars	10.00 to 10.50
Cast iron car wheels	9.00 to 9.50
No. 1 machinery cast	9.00 to 9.50
Railroad malleable	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
Stove plate	7.00 to 7.50
Relay rails, 60 lb. and	
under	16.00 to 16.50

Relay rails, 60 lb. and	
over	\$20.00 to \$21.00
Agricult. malleable	9.00 to 9.50

#### BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$7.00 to \$7.50
Scrap T rails	6.75 to 7.25
Machine shop turnings	4.00 to 4.25
Cast iron borings	4.00 to 4.25
Bundled skeleton, long	5.50 to 6.00
Forge flashings	4.75 to 5.00
Blast furnace scrap	4.75 to 5.00
Shafting	9.00 to 9.50
Steel car axles	8.50 to 9.00
Wrought pipe	3.50 to 4.00
Rails for rerolling	6.00 to 6.50
Cast iron borings, chemical	11.00 to 11.50
Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.25
No. 1 machinery cast	10.00 to 10.25
Stove plate	6.25 to 6.50
Railroad malleable	11.00 to 12.00

#### NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00
No. 2 heavy melting steel	7.00
Unprepared yard iron and	
steel	\$3.50 to 4.00
No. 1 heavy breakable cast	6.00 to 6.25
Machine shop turnings	3.50
Short shoveling turnings	3.50
Cast borings	4.50 to 4.75
No. 1 blast furnace	3.50 to 4.00
Steel car axles	10.00 to 10.50

#### PITTSBURGH

Base per Lb.	
Plates	2.85c
Structural shapes	2.85c
Soft steel bars and small shapes	2.60c
Reinforcing steel bars	2.60c
Cold-finished and screw stock	2.60c
Rounds and hexagons	3.20c
Squares and flats	3.20c
Hoops and bands, under 1/4 in.	2.95c
Hot-rolled annealed sheets (No. 24),	
25 or more bundles	3.15c
Galv. sheets (No. 24), 25 or more	3.50c
Hot-rolled sheets (No. 10)	2.50c
Galv. corrug. sheets (No. 28), per	
square (more than 3750 lb.)	\$3.32
Spikes, large	2.40c
Small	2.45c
Boat	2.90c
Track bolts, all sizes, per 100 count,	
70 per cent off list.	
Machine bolts, 100 count,	
70 per cent off list.	
Carriage bolts, 100 count,	
9 per cent off list.	
Nuts, all styles, 100 count,	
70 per cent off list.	
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'd, base per	
100 lb.	2.90
Wire, galv. soft, base per 100 lb.	3.25
Common wire nails, per keg	2.45
Cement coated nails, per keg	2.45
On plates, structurals, bars, reinforcing	
bars, bands, hoops and blue annealed	
base applied to orders of 400 to	
999 lb.	

#### CHICAGO

Base per Lb.	
Plates and structural shapes	3.00c
Soft steel bars	2.75c
Cold-fn. steel bars and shafting	
Rounds and hexagons	3.25c
Flats and squares	3.25c
Bands, 3/16 in. (in Nos. 10 and	
12 gages)	2.95c
Hoops (No. 14 gage and lighter)	3.50c
Hot-rolled annealed sheets (No. 24)	3.45c
Galv. sheets (No. 24)	4.10c
Hot-rolled sheets (No. 10)	2.85c
Spikes (9/16 in. and lighter)	3.45c
Track bolts	4.30c
Rivets, structural (keg lots)	3c
Rivets, boiler (keg lots)	3c
Per Cent Off List	
Machine bolts	65
Carriage bolts	65
Coach and lag screws	65
Hot-pressed nuts, sq. tap. or blank	65
Hot-pressed nuts, hex. tap. or blank	65
Hex. head cap screws	80 and 10
Cup point set screws	75
Flat head bright wood screws, 50 and 10	
Springs cotter	60 and 10
Stove bolts	72 1/2
Rd. hd. tank rivets, 7/16 in. and	
smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'd wire per 100 lb.	\$3.45
Com. wire nails, base per keg	2.55
Cement c'd nails, base per keg	2.55

#### NEW YORK

Base per lb.	
Plates and struc. shapes	3.10c
Soft steel bars, small shapes	3.10c
Iron bars	3.24c
Iron bars, swed. charcoal	6.00c to 6.50c
Cold-fn. shafting and screw stock	
Rounds and hexagons	3.79c
Flats and squares	4.28c
Cold-rolled strip, soft and quarter	
hard	4.55c
Hoops	3.30c
Bands	3.30c
Hot-rolled sheets (No. 10)	3.00c
Hot-rolled ann'd sheets (No. 24)	3.65c
Galvanized sheets (No. 24)	4.00c
Long term sheets (No. 24)	4.50c
Standard tool steel	12.00c
Wire, black annealed (No. 10)	3.60c
Wire, galv. annealed (No. 10)	4.05c
Tire steel 1/4 x 1/2 in. and larger	3.40c
Smooth finish, 1 to 2 1/4 x 1/4 in.	
and larger	3.75c

Spec. iron and steel pipe	\$4.50 to \$5.00
Forge fire	5.50 to 6.00
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Rails for rolling	8.50 to 9.00
No. 2 cast	8.50 to 9.00
Stove plate	6.00 to 6.50
Cast borings (chemical)	12.00 to 12.50
Per gross ton delivered local foundries:	
No. 1 machinery cast	\$11.00
No. 1 hvy. cast (cupola	
size)	9.00
No. 2 cast	8.00

#### CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$9.50 to \$10.00
Scrap rails for melting	9.25 to 9.75
Loose sheet clippings	5.00 to 5.50
Bundled sheets	6.00 to 6.50
Cast iron borings	5.50 to 6.00
Machine shop turnings	7.00 to 7.50
No. 1 busheling	3.50 to 4.00
No. 2 busheling	3.50 to 4.00
Rails for rolling	9.75 to 10.25
No. 1 locomotive tires	8.50 to 9.00
Short rails	11.50 to 12.00
Cast iron car wheels	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 railroad cast	9.00 to 9.50
Burnt cast	7.00 to 7.50
Stove plate	7.00 to 7.50
Agricultural malleable	8.75 to 9.25
Railroad malleable	9.25 to 9.75

## Warehouse Prices for Steel Products

Open hearth spring steel, bases	
Common wire nails, base, per keg	\$2.90
Machine bolt, cut thread:	
1/4 x 6 in. and smaller	65
1 x 30 in. and smaller	65
Carriage bolts, cut thread:	
1/4 x 6 in. and smaller	65
1/4 x 30 in. and smaller	65
Boiler tubes:	
Lan welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

\*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

#### ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
Cold-fn. rounds, shafting	3.61c
stock	3.61c
Hot-rolled annealed sheets (No. 24)	3.60c
Galv. sheets (No. 24)	4.25c
Hot-rolled sheets (No. 10)	3.10c
Black corrug. sheets (No. 24)	3.60c
Galv. corrug. sheets	4.30c
Structural rivets	3.25c
Boiler rivets	3.25c
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	65
100 lb. or more	65
Less than 100 lb.	65
Machine bolts	65
Carriage bolts	65
Lag screws	65
Hot-pressed nuts, sq. blank or	
tapped, 200 lb. or more	65
Less than 200 lb.	55
Hot-pressed nuts, hex. blank or	
tapped, 200 lb. or more	65
Less than 200 lb.	55

#### PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.60c
*Structural shapes	2.60c
*Soft steel bars, small shapes, iron	
bars (except bands)	2.60c
Reinforce. steel bars, sq., twisted and	
deform.	2.30c
Cold-finished steel bars	3.00c
*Steel hoops	3.15c
*Steel bands, No. 12 to 3/16 in.	
incl.	2.90c
Spring steel	5.00c
*Hot-rolled annealed sheets (No. 24)	3.30c
*Galvanized sheets (No. 24)	3.75c
*Hot-rolled annealed sheets (No.	
10)	2.75c
Diam. pat. floor plates, 1/4 in.	4.35c
Swedish iron bars	6.00c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

\*Base prices subject to deductions on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

#### CLEVELAND

Base per Lb.	
Plates and struc. shapes	2.95c
Soft steel bars	2.75c
Reinforce. steel bars	1.75c to 2.35c
Cold-fn. steel bars:	
Rounds, squares, hexagons	3.25c
Flats	3.40c
Flat rolled steel under 1/4 in.	3.00c
Cold-finished strip	5.55c
Hot-rolled annealed sheets (No. 24)	3.25c
Galvanized sheets (No. 24)	3.85c
Hot-rolled sheets (No. 10)	2.75c
Black ann'd wire, per 100 lb.	\$2.55
No. 9 galv. wire, per 100 lb.	2.90
Com. wire nails, base per keg	2.35

\*Net base, including boxing and cutting to length.

#### CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.25c
Bars, soft steel or iron	3.00c
New billet reinforce. bars	3.00c
Rail steel reinforce. bars	3.00c
Hoops	3.75c
Bands	3.20c
Cold-finished bars	3.57c

#### DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$8.25 to \$8.75
Borings and short turnings	6.25 to 6.75
Long turnings	5.75 to 6.25
No. 1 machinery cast	8.00 to 8.50
Automotive cast	9.50 to 10.00
Hydraulic comp. sheets	8.25 to 8.75
Stove plate	6.00 to 6.50
New factory busheling	7.25 to 7.75
Old No. 2 busheling	5.25 to 5.75
Sheet clippings	5.50 to 6.00
Flashings	6.50 to 7.00
Low phos. plate scrap	9.00 to 9.50

#### CANADA

Dealers' buying prices per gross ton:	
Toronto Montreal	
Heavy melting steel	\$5.50 \$5.25
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.



# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NEW ENGLAND ▶

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Oct. 4 for pumping machinery and auxiliary mechanical equipment, sludge equipment, chlorinating house, pipe lines, etc., for sewage disposal plant at Naval submarine base, New London, Conn. (Specifications 7072).

**Saco-Lowell Shops**, Smith Street, Biddeford, Me., manufacturer of textile machinery and parts, has let general contract to Megquier & Jones Co., 31 Pearl Street, Portland, Me., for one-story foundry at branch plant, Saco, Me. Cost over \$25,000 with equipment. A similar foundry unit is being considered at Biddeford works.

**Brightwater Paper Co.**, Adams, Mass., recently organized, has arranged for lease of local mill of Eaton Paper Co., and will improve and operate for plant for manufacture of writing papers and kindred stocks.

**Armstrong Rubber Co.**, Elm Street, West Haven, Conn., manufacturer of automobile tires, tubes, etc., has asked bids on general contract for two and three-story additions, 80 x 180 ft., to be used in part for storage and distribution. Cost about \$30,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, Bridgeport, Conn., architect and engineer.

## ◀ NORTH ATLANTIC ▶

**Emerson Radio & Phonograph Corp.**, 641 Sixth Avenue, New York, manufacturer of radio equipment, talking machine parts, etc., has leased 40,000 sq. ft. in the new Port of Authority Commerce Building, 111 Eighth Avenue, and will occupy for new plant, including laboratories for experimental work.

**Rossville Alcohol & Chemical Corp.**, affiliated with American Solvents & Chemical Corp., 122 East Forty-second Street, New York, has arranged for change of name to Rossville Union Distilleries, Inc., and will develop and improve three main plants at Newark, N. J., Lawrenceburg, Ind., and Carthage, Ohio, for production of distilled liquors, including changes in equipment. Company recently disposed of industrial alcohol business to Commercial Solvents Corp., 230 Park Avenue, New York, which is now making extensions to plant at Terre Haute, Ind.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Sept. 27 for three 800-hp. cross-drum, bent tube-type boilers, superheaters, turbine-driven stokers, motor-driven forced draft fans, soot blowers, automatic combustion control with master controller, valves and accessories (Specification 7180), coal and ash-handling equipment, smoke flue, piping and auxiliary equipment (Specification 7182), condenser and complete accessory equipment (Specification 7231) for central power plant, Navy Yard, New York.

**Broadway Maintenance Corp.**, 136 West Twenty-first Street, New York, manufacturer of electric signs and displays, has leased 6000 sq. ft. at 40-35 Twenty-fourth Street, Long Island City, and will occupy for new plant.

**General Cable Corp.**, 420 Lexington Avenue, New York, manufacturer of aluminum and copper cable, wires, etc., has plans for one-story plant, 152 x 322 ft., at Ninth and Esperanza Streets, Los Angeles, where site was recently acquired. Cost about \$200,000 with equipment. Ernest C. Batty, Pacific Electric Building, Los Angeles, architect.

**Wagner Electric Corp.**, Automotive Division, 503 West Fifty-sixth Street, New York, manufacturer of electric equipment and appliances, with headquarters at 6400 Plymouth Street, St. Louis, has leased space in building at 37-43 West Sixty-fifth Street, for new branch service and repair works.

**Tal-Alarm Corp.**, New York, has been organized by Morris Gabel, 320 Sterling Street, and Louis Lieberman, 486 Eastern Parkway, both Brooklyn, to manufacture fire and burglar alarm equipment and systems.

**H. & L. Machine Co.**, New York, recently organized, has leased space in building at 157 West Twenty-second Street for general machine and repair works.

**Seaboard Storage Corp.**, 643-67 Smith Street, Brooklyn, is arranging lease of two buildings and 2300 ft. waterfront property from city of

Newark, N. J., at Port Newark, for new storage and distributing plant for flour, sugar and other bulk food products. Plans will soon be drawn for new multi-story unit on part of site, to cost about \$100,000 with elevating, conveying, loading and other mechanical-handling equipment.

**Sonoco Products Co., Inc.**, 709 West Front Street, Plainfield, N. J., manufacturer of paperboard, paper tubing and kindred products, with headquarters at Hartsville, S. C., has let general contract to Wigton-Abbott Corp., 143 Liberty Street, New York, for alterations and improvements in former building No. 3 of Aeolian Co., North Avenue, Garwood, N. J., about 100,000 sq. ft. floor space, recently acquired for new plant. Cost over \$30,000. Early installation of machinery planned. Plainfield works will be removed to new location and capacity increased.

**Atlas Refinery**, foot of Lockwood Street, Newark, N. J., oil products, has plans for new three-story refining unit, 50 x 55 ft. Cost over \$35,000 with equipment.

**Bureau of Yards and Docks**, Navy Department, Washington, has secured appropriation of \$65,000 for extensions and improvements in power plant at Fort Mifflin, Pa., for central heating service, and soon takes bids; also \$48,000 for extensions and betterments in distributing system, same place; and \$100,000 for new air compressor equipment, replacing present compressor units, Philadelphia Navy Yard. Bids soon asked.

**Board of Directors**, Berean Manual Training and Industrial School, 1926 South College Avenue, Philadelphia, has asked bids on general contract for extensions and improvements. Richard R. Neely, Philadelphia, architect.

**Northampton Brewery Corp.**, Northampton, Pa., is planning expansion and installation of equipment to increase capacity from 225,000 to 400,000 bbl. per annum.

**Lycoming Mfg. Co.**, Williamsport, Pa., manufacturer of aircraft and automobile motors, parts, etc., subsidiary of Cord Corp., 105 West Adams Street, Chicago, will establish division for manufacture of propellers and allied equipment for airplanes, heretofore produced by Smith Engineering Co., Cleveland, recently acquired by parent company and now operated as unit of that organization. Certain equipment will be removed from Cleveland plant to Williamsport works for new department.

**City Council**, Reading, Pa., plans installation of pumping machinery and other mechanical equipment, filtering machinery, pipe lines, etc., for expansion and improvement in municipal water system. Bond issue of \$1,850,000 being arranged for work.

## ◀ SOUTH ATLANTIC ▶

**Board of Public Works**, Savannah, Ga., plans development of tract of over 200 acres of waterfront property for new municipal terminal, consisting of six main operating units, one and two-story, 162 x 1200 ft., 254 x 320 ft., 120 x 130 ft., 320 x 350 ft., 100 x 800 ft., and 300 x 800 ft., with bulkhead, wharf and battery of steel tanks for turpentine and other liquid storage. Project will include a two-story cold storage and refrigerating plant for perishable commodities, tobacco processing unit, and building for rosin storage and distribution. Terminal will be equipped with traveling cranes, conveyors, loading machinery and other mechanical-handling equipment. Fund of \$2,813,000 is being arranged. Robert & Co., Bona Allen Building, Atlanta, Ga., engineers.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Sept. 27 for four hangars with repair and reconditioning shop facilities (Specifications 7350); until Oct. 11 for electrical distribution system, including cable, transformers, ducts, etc. (Specifications 4708), for steam distribution system, including pipe lines, conduits, etc. (Specifications 7407), industrial buildings, administration building and other structures (Specifications 7404), steam power plant, including watertube and firebox boilers, motor and turbine-driven air blowers, boiler feed pumps, fuel oil pumping and heating equipment, motor and turbine-driven induced draft fans, fuel oil storage tanks, feed water heater with storage tank, hot well pump with motor-driven sump pumps, air atomizing oil burners and complete accessories (Specifications 7405) for Naval air station. Corry Field, Pensacola, Fla.

## ◀ WESTERN PENNA. ▶

**Selden Co.**, Bridgeville, Pa., manufacturer of coal tar products, has awarded general contract to Rust Engineering Co., Koppers Building, Pittsburgh, for new one-story addition, 40 x 125 ft., for storage and distribution. Company will carry out expansion program at local works, including removal of portion of plant on McCartney Street, West End, Pittsburgh, to that location.

**United States Engineer Office**, Huntington, W. Va., asks bids until Oct. 2, for construction of twin locks in Kanawha River, near Winfield, W. Va., including power house and complete operating machinery, gates, etc.

**West Virginia Brewing Co.**, Huntington, W. Va., has acquired former local plant of Fesenmeier Packing Co., and will remodel and expand for new plant. Cost about \$150,000 with equipment. Konrad Keil, 1215 Windsor Drive, Dayton, Ohio, is engineer. M. I. Fesenmeier is president.

**Pennsylvania Refining Co.**, Butler, Pa., soon takes bids for new refining unit at Titusville, Pa., including improvements in present plant. Cost over \$100,000 with equipment. Arthur G. McKee & Co., 2422 Euclid Avenue, Cleveland, are engineers.

**United States Engineer Office**, Pittsburgh, has plans and soon takes bids for construction of large roller crest dam in Ohio River, Montgomery Island, near Beaver, Pa., including ten structural steel roller gates, each 16 ft. high and 100 ft. long, structural steel service bridge, 1500 ft. long, etc. Structure will be designed to carry one 30-ton locomotive crane, and two other cranes each of 15-ton capacity.

## ◀ BUFFALO DISTRICT ▶

**Covert Gear & Mfg. Corp.**, Lockport, N. Y., has been organized under Delaware laws, capital \$100,000, to take over local plant and business of Covert Gear & Mfg. Co., Grand and Lock Streets, recently acquired at a receiver's sale by F. H. Sore, Columbus, Ohio, and associates. New owner will make improvements and plans early resumption for manufacture of transmission systems, gears, axles, clutches and kindred products.

**Huron Portland Cement Co.**, Ford Building, Detroit, has let general contract to Burrell Engineering & Construction Co., 400 West Madison Street, Chicago, for new mill at Oswego, N. Y., including packing, storage and loading units. Cost about \$175,000 with equipment.

**McCarthy-Webb-Goudreau, Ltd.**, Goudreau, Ont., plans extensions and improvements in milling plant at gold mining properties, with installation of additional equipment. Cost about \$75,000 with machinery.

## ◀ SOUTH CENTRAL ▶

**American Medicinal Spirits Co.**, Twenty-eighth Street, Louisville, has let contract to Louisville Bridge & Iron Co., Louisville, for new one-story addition, 100 x 300 ft., at Sunnybrook distillery, with power house and other mechanical units. Cost about \$200,000 with equipment. Leslie V. Abbott, 8 Linwood Boulevard, architect.

**Clay Street Brewing Co.**, 4552 Western Parkway, Louisville, George W. Schardein, president, plans extensions and improvements in plant at 508-12 South Clay Street. Cost over \$100,000 with equipment. Joseph & Joseph, Breslin Building, architects.

**Common Council**, Jeanette, La., plans installation of pumping machinery and auxiliary mechanical equipment, pipe lines, etc., for municipal waterworks. Cost about \$75,000. Early call for bids planned.

**Town Council**, Rayne, La., plans construction of pumping plant with electric-operated pumping machinery, filter equipment, pipe lines, etc., for extensions and improvements in municipal water and sewerage systems. Cost about \$150,000. L. J. Voorhies, Baton Rouge, La., consulting engineer.

**Germania Brewing Co.**, Covington, Ky., care of Engineering & Finance Corp., Carew Tower, Cincinnati, recently organized, plans new multi-story plant at Fourteenth and Spring Streets, Covington. Cost over \$125,000 with equipment.

## ◀ WASHINGTON DISTRICT ▶

**Board of District Commissioners**, District Building, Washington, asks bids until Sept. 29, for two single suction multi-stage centrifugal pumps, and one other pumping unit.

**City Council**, Radford, Va., has secured Federal permission for construction of hydro-electric generating plant on Little River, including transmission line to city. Cost \$129,000 with equipment, and financing is being arranged.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Sept. 27, for extensions and improvements in steam power plant at local Navy yard, including stoker-fired furnaces, motor and turbine-driven forced-draft fans, ash sluicing system, coal chutes and auxiliary equipment (Specifications 7428).

**National Brewing Co.**, 3700 O'Donnell Street, Baltimore, has plans for new one and two-story additions to main plant. Cost over \$85,000 with equipment. Eugene A. Stopper, Liberty Trust Building, Philadelphia, architect.

**Coast Guard Headquarters**, Washington, asks bids until Sept. 25, for propulsion equipment for four to six vessels, each consisting of two 300-bhp., one 3-unit engine-driven generator and compressor set, air compressor, six air storage tanks with fittings, two lubricating oil filter tanks, two lubricating oil coolers, special tools, wrenches, etc. (Proposal 3110).

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Sept. 26, for 12 hand-driven testing generators (Schedule 740-R), for Boston, Philadelphia, and Puget Sound Navy Yards; 32,000 aluminum permanent mold castings (Schedule 721-R), for Newport, R. I., Navy Yard; 4305 steel boiler tubes (Schedule 670), for Eastern and Western Navy Yards; quantity corrosion-resisting steel floor plates (Schedule 725), quantity corrosion-resisting bar steel, shapes and plates (Schedule 700) for Washington Navy Yard.

## ◀ OHIO AND INDIANA ▶

**Leisy Brewing Co.**, 3328 Vega Avenue, Cleveland, H. Leisy, head, recently organized, has let general contract to Crowell Construction Co., Hanna Building, for modernization and extensions in industrial buildings, location noted, to be converted for brewery, including new two-story and basement addition, with power house, machine shop and other mechanical units. Cost about \$500,000 with equipment. G. A. Mueller, 1346 Broadway, Detroit, architect and engineer.

**City Council**, Alliance, Ohio, has authorized plans for new municipal electric light and power plant. Cost estimated over \$250,000 with equipment. Lloyd Varner, city engineer.

**Owens-Illinois Glass Co.**, 965 Wall Street, Toledo, Ohio, manufacturer of beer bottles and kindred containers, will carry out expansion at branch plant at Columbus, Ohio, with installation of equipment for increased production. Cost over \$75,000 with machinery.

**Fairmount Brewing Co.**, Westmore Avenue and Quebec Road, Cincinnati, soon takes bids for extensions and improvements in multi-story storage and distributing unit, including new mechanical bottling works and installation of conveying and other machinery. Cost about \$175,000 with equipment. Newhouse & Bernham, Inc., 8 South Michigan Avenue, Chicago, architect.

**Cook Wagon Co.**, Marion, Ohio, will reopen former wagon works, idle for number of years, for parts production and assembling of new line of mechanical specialties for juvenile sport service, including merry-go-round units operated by foot pedals, and similar equipment.

**Department of Public Service**, Dover, Ohio, C. H. Krantz, director, is securing fund of \$105,000 for extensions and improvements in municipal electric light and power plant, including installation of new steam turbine unit and auxiliary equipment. Waldo Hartline, city engineer.

**Andrew Juergens Co.**, Spring Grove Avenue and Alfred Street, Cincinnati, manufacturer of soaps, etc., has let general contract to Parkway Construction Co., Keith Building, for six-story addition, 28 x 65 ft., and two-story top extension to present factory, 61 x 112 ft. Cost over \$80,000 with equipment. John J. Brown is company architect. Plans are being considered for new power plant for factory service. Cost about \$40,000 with equipment. A. M. Kinney, Inc., Carew Tower, consulting engineer.

**Container Corp. of America**, 111 West Washington Street, Chicago, manufacturer of corrugated and other containers, cartons, etc., has taken over mill of Wabash Coating Mills, Wabash, Ind., and will use for new plant for production of coated paperboard and paper

stocks for container service. Increased capacity will be carried out.

**Richard Lieber Brewing Co.**, 1254 South West Street, Indianapolis, Richard Lieber, president, has let general contract to A. V. Stackhouse, West Seventy-fifth Street, for extensions and improvements in plant, to include equipment installation to increase capacity to 175,000 bbl. per year. Cost over \$125,000 with equipment.

## ◀ MIDDLE WEST ▶

**United States Engineer Office**, Rock Island, Ill., asks bids until Sept. 29 for construction of dam at lock and dam No. 20, Mississippi River, near Canton, Mo., including three roller gates, with pier armatures; roller gate operating machinery, including hoisting chain and electrical equipment; power house, gate heaters, 12 hand winches, 18 bulkhead storage cars, 262,501 lb. steel forgings, 131,360 lb. nickel steel forgings, 527,507 lb. class B steel castings, steel pipe, wrought iron pipe, etc. (Circular 17).

**Hiram Walker & Sons, Inc.**, Union Guardian Building, Detroit, a subsidiary of Hiram Walker-Gooderham & Worts, Ltd., Walkerville, Ont., distiller, begins superstructure at once for new multi-unit distillery on 15-acre tract of land at Peoria, Ill. Cost about \$1,000,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, Detroit, architects and engineers.

**Theodore Hamm Brewing Co.**, 681 East Minnehaha Street, St. Paul, Minn., has let general contract to William Baumeister Construction Co., Pioneer Building, for one-story motor truck service, repair and garage building, 135 x 227 ft., on Payne Avenue. Cost about \$85,000 with tools and equipment, hoists, conveyors, etc.

**Common Council**, David City, Neb., plans installation of 100,000-gal. steel tank on 120-ft. tower in connection with extensions and improvements in municipal waterworks. Hollister Engineering Co., Banks' Life Building, Lincoln, Neb., consulting engineer.

**Graham Brothers Distillery**, South Main Street, Rockford, Ill., has plans for new one-story steam power plant, 30 x 40 ft. Chester E. Wolfley, Talcott Building, architect.

**Albert Lea Brewing Co.**, Albert Lea, Minn., organized by F. Mayer Sushansky, Norwalk Products Co., 150 North Irving Avenue, Minneapolis, Minn., and associates, plans to take over local three-story building, 45 x 120 ft., and will remodel and equip for new plant. Cost over \$75,000 with equipment.

**City Council**, Gering, Neb., plans new municipal electric light and power plant, with Diesel engine-generator unit and auxiliary equipment. Fund of \$65,000 being arranged.

## ◀ SOUTHWEST ▶

**Midwest Brewing Co.**, Eighteenth Street and Agnes Avenue, Kansas City, Mo., will proceed with construction by day labor on new eight-story and basement plant, with one-story boiler house, 20 x 20 ft., adjoining, at location noted. Cost over \$200,000 with brewing, bottling, mechanical-cooling, conveying and other equipment. A. B. Anderson, Davidson Building, architect; George Wentzel, same address, engineer.

**Gruman Machine & Appliance Co.**, Kirkwood, Mo., has been organized by Horace F. Gruman and N. S. Knower, Kirkwood, to manufacture machinery, parts, and mechanical appliances.

**Hesse Envelope & Lithographing Co.**, 4173 North Kingshighway, St. Louis, soon takes bids for three-story and basement addition, 25 x 185 ft., to paper converting plant. Cost over \$35,000 with equipment. Leonard Haeger, 3844 Utah Place, is architect.

**Crescent Brewing Co.**, Joplin, Mo., recently organized, care of T. E. Martinie, Zahn Building, architect, soon begins superstructure for five-story and basement plant, 150 x 300 ft., at Tenth and Wall Streets, with power house and other mechanical units. Cost about \$375,000 with equipment.

**Common Council**, New London, Mo., plans municipal electric light and power plant, and distributing system. Cost over \$85,000 with equipment. W. A. Fuller Co., 2916 Shenandoah Avenue, St. Louis, consulting engineer.

**Kirkwood Sash & Door Co.**, 220 East Monroe Street, Kirkwood, Mo., plans rebuilding of portion of millwork plant, recently destroyed by fire. Loss about \$25,000 with equipment.

**Common Council**, O'Fallon, Mo., has authorized bonds for \$250,000 for new municipal electric light and power plant, and plans early construction.

**Old Mill Brewing Co.**, Lee's Summit, Mo., J. S. Noel, head, care of George Wentzel,

Davidson Building, Kansas City, Mo., engineer, plans new plant, with boiler house, machine shop and other mechanical units. Cost about \$85,000.

**Common Council**, Georgetown, Tex., plans installation of pumping machinery and other mechanical equipment for extensions and improvements in municipal waterworks. Fund of \$45,000 is being arranged.

**Kimball Oil Mill**, Sherman, Tex., has acquired local plant of Mutual Refining Co., North Willow Street, and portion of works of Interstate Cotton Oil Refining Co. Last noted will be developed for new oil refining and compounding plant, with construction of one-story addition, 60 x 150 ft. Certain equipment from Mutual plant noted will be removed to new location. Cost over \$75,000 with machinery. George Smith is company engineer.

## ◀ MICHIGAN DISTRICT ▶

**Grand Central Screw Co.**, Coldwater, Mich., manufacturer of screw machine products, has leased portion of building formerly used by Burr Oak Mfg. Co., Burr Oak, Mich., and will occupy for new plant. Present works will be removed to new location and capacity increased.

**Rubber Products Co.**, Plymouth, Mich., recently organized to manufacture mechanical rubber specialties, molded rubber products; etc., has taken over local factory and will occupy at once. C. B. Meyers, formerly with Baldwin Rubber Co., Pontiac, Mich., is president; H. B. Denman, also identified with Baldwin company, is vice-president and general manager.

**Haehle Brewing Co.**, Jackson, Mich., has let general contract to North-Moller Co., Jackson, for extensions and improvements, including remodeling of former storage buildings for new brewing unit. Cost over \$85,000 with equipment.

**Fort Dearborn Brewing Corp.**, 2074 First National Bank Building, Detroit, E. R. Stroh, president, recently organized, has engaged Albert Kahn, Inc., New Center Building, architect and engineer, to prepare plans for multi-story brewery at Schaefer Road and Schaden Avenue, Fort Dearborn. Cost over \$600,000 with equipment.

## ◀ PACIFIC COAST ▶

**Santa Barbara Brewing Co.**, Santa Barbara, Cal., recently organized by Henning Bruhn and W. C. Merkel, Santa Barbara, has engaged Edwards & Plunkett, 20 East Figueroa Street, architects and engineers, to draw plans for new plant on Anacapa Street, consisting of several units, with power house. Cost over \$125,000 with equipment.

**East Bay Municipal Utility District**, 512 Sixteenth Street, Oakland, Cal., plans extensions and improvements in power facilities and transmission lines, including construction of new hydroelectric generating plant on Upper Mokelumne River and new steam-electric power plant at Oakland for standby service. Fund of \$8,409,000 is being arranged.

**California Container Co.**, Emeryville, Cal., recently organized under Delaware laws by C. J. Munes and associates, to manufacture corrugated and other paper and paperboard boxes and containers, has taken over former local plant of Rheem Mfg. Co., 4535 Horton Street, and will remodel and equip for plant. Cost over \$100,000 with machinery. Mr. Munes will be president; G. A. Vollmer is vice-president.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Sept. 26 for 20,000 ft. lighting and power cable (Schedule 687), 10,000 lb. rivet steel (Schedule 678), 30,300 lb. medium bar steel (Schedule 677), 600 lb. corrosion-resisting bar steel (Schedule 676) for Mare Island, Cal., Navy Yard.

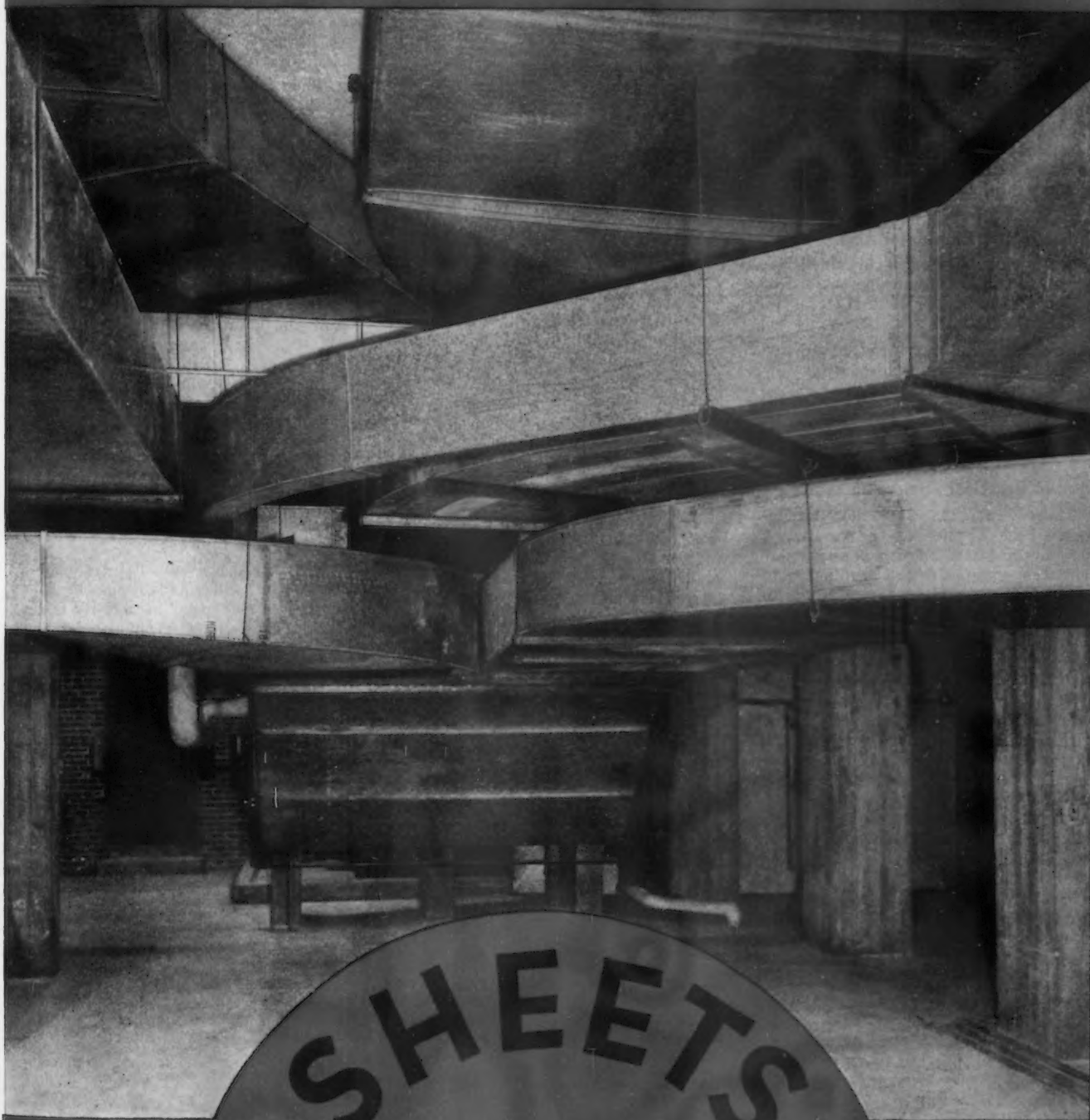
**Bureau of Yards and Docks**, Navy Department, Washington, has secured appropriations as follows and plans early call for bids: Extensions and improvements in power plant, Mare Island, Cal., Navy Yard, \$150,000 with equipment; assembling shop, \$175,000 with equipment; steam power plant for central heating service, \$160,000, distributing and service lines, \$30,000, at San Diego, Cal., Navy Yard.

**Pilsner Brewing Co.**, Seattle, H. R. Fish-naller, president, plans branch brewery at Portland, to be equipped for initial capacity of 250 bbl. per day. Cost close to \$300,000 with equipment.

**Board of City Trustees**, Selma, Cal., is arranging financing for fund of \$57,300 for construction of a municipal electric light and power plant, using Diesel engine-generating unit. Edward K. Hussey, Syndicate Building, Oakland, Cal., is consulting engineer.



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# Determining Aluminum, Silicon, Chromium Oxides in Corrosion-Resisting Steels

(Continued from Page 25)

In this laboratory 30 per cent hydrogen peroxide has been tried as a substitute for 1.20 sp. g. nitric acid. 30 ml. per 25 g. of steel are added carefully to the cold sulphuric solution after the steel has been decomposed as far as possible with the 1:3  $H_2SO_4$ . The peroxide must be added cautiously with stirring, and then the solution brought to boiling and boiled about 5 min.

## Hydrogen Peroxide As a Carbide Eliminator

The results thus far obtained are shown in the accompanying table. The action of the 30 per cent  $H_2O_2$  is violent in 2:1 HCl.

The foregoing nitric-sulphuric and sulphuric-peroxide methods are offered as schemes for testing the relative cleanliness of melting practice in any one heat as compared to another one. In routine control, the time consuming refinements of extreme accuracy are not practical or necessary.

These methods are not recommended as applicable to all carbon percentages and all other alloy percentages except where applied and found to be the most logical ones to date.

As they are the most searching that we have found so far in our own investigations for the removal of carbides of chromium, etc., we are inclined to call the  $Cr_2O_3$  still remaining with the  $Al_2O_3$  as an index, at least, of the Cr existing as oxide in the steel. Especially do we feel justified in so doing when the carbon of the steel does not exceed the order of 0.15 to 0.20 per cent. The hydrogen peroxide method is more rapid and more comfortable to work with than the nitric way, but in some cases it does not decompose the Cr carbides as completely as the  $H_2SO_4 + HNO_3$ .

Those interested in the HCl method are referred to R.P. 496, Bureau of Standards, Journal of Research, Vol. 9, November, 1932, No. 5. "Determination of  $Al_2O_3$  and  $SiO_2$  in steel by HCl Acid Residue Method." J. G. Thompson & S. J. Acken, p. 615. No suggestions are offered therein to cope with carbides.

## Iron and Manganese Oxides in First Main Insolubles

Sometimes the  $Al_2O_3$  instead of igniting to practically white color may be badly discolored by presence of appreciable amounts of oxide manganese and iron. This is especially true when the foregoing methods are applied to determination of alumina in wrought iron. Witness the case of the alleged Swedish magnetic iron which not only contained much oxides of Mn and Fe but a remarkable amount

of insoluble  $Cr_2O_3$ . (See table). In such cases proceed exactly as given under "Separation by Fusion" to the point where the insolubles are washed about 40 washings with  $Na_2CO_3$  wash.

These washed residues on the filters contain all of the  $Mn_2O_3$ ,  $Fe_2O_3$  free of  $Al_2O_3 + Cr_2O_3$ . Wash further with 50 washings of  $NH_4NO_3$  wash. Ignite same at low red and weigh as oxides. On dissolving these  $NaCO_3$  fusions in  $H_2O$ , where considerable iron and manganese are present, the crucible will be stained inside and out with brown oxide of Mn.

Warm the crucible in a little 1:1 HCl in a small porcelain dish. Rinse crucible and add a slight excess of  $Na_2CO_3$  ash to these cleanings; heat to boiling and rinse same into the main water solution of the carbonate fusion. Do this before the main water insolubles contained therein are filtered off and washed with the  $Na_2CO_3$  wash, and then with  $NH_4NO_3$ . Ignite at low red in platinum. The total  $Mn_2O_3$  and  $Fe_2O_3$  ash is weighted and fused with 5 g. of  $K_2S_2O_7$ . The fusion dissolved in 1:3  $H_2SO_4$  by boiling. The Mn in this sulphuric solution can then be determined by any of the usual methods, calculated to  $Mn_2O_3$ , and the  $Fe_2O_3$  obtained by difference. Or the solution of the fusion can be divided into two equal parts and the  $Mn_2O_3$  gotten from one portion and the  $Fe_2O_3$  from the other. Calculate finally to MnO and FeO.

Never grind off the scale and surface of the steel with an emery or other grit wheel, as fine particles of the grit may become embedded in the otherwise clean surface.

## Precautions in Sampling

If it is not practical to machine the surface, and it usually is not, then first pickle off the scale with hot 4 to 10 per cent solutions of sulphuric or hydrochloric acid.

Then if the section is thick enough, drill the sampling hole to size and reject these drillings. If the section is too thin to drill, file the surface bright with a new file and mill the sample. Do not drill or mill the sample so fast as to blue the drillings.

## Higher Silicon Steels

The 18-8 steels with Si of about 0.60 per cent and over should be evaporated until the sulphates salt out and the solution is almost to fumes of  $SO_3$ . This coagulates the Si gel and renders it filterable. Cool; bring to the original volume with  $H_2O$ . Heat till all salts are dissolved. Then give the nitric treatment.

## Analyzing Special Iron

The complete method of examination of total insolubles from so-called "special" iron, being from a 0.125-in. sheet, is as follows:

The total insolubles after carbonate extraction and removal of the silica by HF were fused at a mild yellow heat for 5 min.; cooled; dissolved out by heating, without boiling, in a small porcelain dish.

The water insolubles consisted mainly of oxides of iron and man-

(Continued on Page 62)

TABLE SHOWING SOME PERCENTAGES OF  $Al_2O_3$ , ETC., FOUND BY USE OF DIFFERENT METHODS

Kind of Steel	Method $H_2SO_4 =$ $HNO_3$ per cent		Method $H_2SO_4 =$ $H_2O_2$ per cent		U. S. Bureau's Official Figures for Al calculated to $Al_2O_3$ , per cent
	$Al_2O_3$	$SiO_2$	$Al_2O_3$	$SiO_2$	
U. S. Bureau's No. 55 ingot iron	0.0030	nil	0.003	nil	0.0038 (0.002 "Al")*
U. S. Bureau No. 16b 1.01 per cent carbon 0.08 per cent silicon	0.009	0.002	0.009	0.002	0.015 (0.008 "Al")**
No. 354 Cr. Mo. steel	0.012	0.002	0.012	0.001	.....
No. 358 Cr. Mo. steel	0.012	0.001	0.012	0.002	.....
No. 287 Cr. W. steel	0.016	0.002	0.015	0.002	.....
Resistal KA-2 (18-8)	0.006	0.006	0.006	0.006	.....
"Special" Iron					
0.01 per cent carbon	Per Cent of Total Insolubles by $H_2SO_4 = HNO_3$		Total Insolubles by $H_2SO_4 = H_2O_2$		Per Cent $Cr_2O_3$
0.01 per cent manganese					
Not over 0.02 per cent chrome	Metallic oxides $SiO_2$		Metallic oxides $SiO_2$		0.055
	0.117		0.119		0.001

The insolubles from the "Special Iron" ignited to a coal black ash. On fusing them as given under " $Cr_2O_3$ ," the water extraction revealed a high per cent of  $Cr_2O_3$  in the ash, amounting to 49.7 per cent  $Cr_2O_3$  or 0.055 per cent  $Cr_2O_3$  in the iron. From another lot of the ash, the iron oxide was determined by fusing it in  $Na_2CO_3 + KNO_3$ . The chromate was leached out of this melt.

\* A private communication from the acting director of U. S. Bureau of Standards stated that it is probable that the percentages given as "Aluminum" in No. 55 and No. 16b are mainly from an equivalent amount of  $Al_2O_3$  in the steel. The figures found tend to confirm this assumption.

\*\* Further advice from Bureau of Standards states its chemists have just determined  $Al_2O_3$  on 16b and find by method for plain steels, given in Research Paper No. 496 (Journal of Research, Nov., 1932, Vol. 9, No. 5), 0.009 and 0.010 per cent  $Al_2O_3$ , and this water insoluble was washed, ignited, fused with 5 gr.  $K_2S_2O_7$ ; the melt was cooled; dissolved by boiling it in 100 ml. 1:3  $H_2SO_4$ . The cold  $H_2SO_4$  solution was put through the Jones reductor to get the Fe which was calculated to  $Fe_2O_3$ . From a similarly fused ash the Mn was obtained in Cr free sulphate solution and determined as in steel and calculated to  $Mn_2O_3$ . The ash showed: 8.3 per cent  $Mn_2O_3$ ; 34.4 per cent  $Fe_2O_3$ ; 49.7 per cent  $Cr_2O_3$ . This left enough undetermined in the ash to give 0.01 per cent  $Al_2O_3$  in the iron.



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(Continued from Page 60)

ganese, and still a little  $\text{Cr}_2\text{O}_3$ . If the  $\text{Cr}_2\text{O}_3$  present in the total insolubles be in greater amount than 2 or 3 mg., then these water insolubles must be fused again with the same flux, namely, 5 g. of  $\text{Na}_2\text{O}_2$  + 0.020 g. of  $\text{KNO}_3$ . These water insolubles from the first fusion are, therefore, filtered out through 9 cm. double filters, using a little pulp; washed 25 times with 5 per cent  $\text{Na}_2\text{CO}_3$  wash. Put back in the same crucible, ignited at low red heat and fused; dissolved out in water and washed this time 50 times with 3 per cent  $\text{NH}_4\text{NO}_3$  wash.

Ignite these twice fused oxides in the same crucible again. This crucible meanwhile has been warmed with 2 or 3 ml. 1:1  $\text{HCl}$  in it to clean out all stains of manganese and iron oxides. These cleanings are rinsed into the water solution of the second carbonate fusion. The solution is then heated a while after these cleanings are added to it.

If this solution has a green color due to manganate in solution, add a few drops of absolute alcohol and heat until the green color is gone. This still highly alkaline water solution is then filtered free of the water and carbonate insolubles, which are washed free of sodium salts with the  $\text{NH}_4\text{NO}_3$  wash, i.e., 50 washings as already stated.

The washed residue consisting of the total  $\text{Mn}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$  and any  $\text{TiO}_2$ , now free of  $\text{SiO}_2$  and  $\text{Cr}_2\text{O}_3$ , is returned to the cleaned crucible which has been heated and reweighed. Ignite residue at red heat free of paper and weigh as total  $\text{Mn}_2\text{O}_3$ ,  $\text{Fe}_2\text{O}_3$ , and  $\text{TiO}_2$  from the original total insolubles.

The  $\text{Mn}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$  are fused at lowest red heat with 5 g.  $\text{K}_2\text{S}_2\text{O}_7$  till clear melted. Melt is cooled, and placed in a 300 ml. beaker with 100 ml. 1:3  $\text{H}_2\text{SO}_4$  and heated to boiling until dissolved. The volume of this solution is reduced by evaporation (below boiling) in the open beaker; cooled to room temperature; transferred to 100 ml. glass stoppered graduated cylinder; diluted to mark; mixed; and exactly 50 ml. poured into a manganese, cone-shaped boiling flask. To this add 100 mg. of ingot iron and heat till iron is dissolved; add 15 ml. conc. nitric acid; boil off red fumes. Then boil  $2\frac{1}{2}$  minutes with specially prepared brown  $\text{PbO}_2^*$  as in steel; cool; filter at once through asbestos plug and titrate at once to disappearance of pink color for total Mn content. Use sodium arsenite standard as in plain steel. (See calculations).

In order that the Mn value of the arsenite standard shall be gotten under the same conditions as the sample, select a steel standard which will contain about the same total Mn content as the  $\frac{1}{2}$  portion of the sample. Dis-

\* See "Analysis of Special Steels," fourth edition, p. 602.

solve 0.100 g. of this standard in 50 ml. 1:3  $\text{H}_2\text{SO}_4$  and  $2\frac{1}{2}$  g.  $\text{K}_2\text{S}_2\text{O}_7$ ; then add 10 ml. conc.  $\text{HNO}_3$ ; boil off red fumes; boil with the brown  $\text{PbO}_2$ , etc. The arsenite standard is the same as used for steel and 1 ml. = about 0.07 mg. of Mn under the conditions cited. (See calculations.)

#### Iron Oxide

The one-half portion consisting of 50 ml. retained for  $\text{Fe}_2\text{O}_3$  in the 100 ml. graduated cylinder is rinsed into its beaker, and at a volume of 100 ml. is poured through the Jones reductor at the rate of 15 min. for the 100 ml. and titrated with  $\text{KMnO}_4$  std. (1 ml. = 0.00253 g. Fe) to slight permanent pink tint. The  $\text{KMnO}_4$  standard is made by dissolving 3.16 g. in a small beaker and diluting to 2 l. The standard was checked with 0.005 and 0.010 g. of U. S. Sibley iron ore standard by dissolving below boiling with 50 conc.  $\text{HCl}$ ; fuming to  $\text{SO}_2$  with 50 ml. 1:3  $\text{H}_2\text{SO}_4$  and redissolving in 50 ml.  $\text{H}_2\text{O}$  by heating till clear dissolved. Then put through the reductor at 15 min. speed. (See calculations.)

#### Chromate

The yellow chromate, carbonate and nitre solutions from the two fusions to extract the  $\text{Cr}_2\text{O}_3$  were acidulated with 1:3  $\text{H}_2\text{SO}_4$  and 50 ml. excess of 1:3; combined; taken to fumes of  $\text{SO}_3$ ; dissolved in water, making volume up to 250 ml. Add 10 ml. 1.20 sp. g.  $\text{HNO}_3$  and heat to boiling. Add  $\text{KMnO}_4$  oxidizing solution, a drop at a time, until the  $\text{KMnO}_4$  color remains unchanged after 15 min. boiling, or decomposes to Mn oxide. If the  $\text{KMnO}_4$  color still persists, then add a few drops of manganous sulphate solution, as in similar cases in plain steels. Boil until all  $\text{KMnO}_4$  color is gone and only manganese oxide remains. Filter out the latter on an

asbestos plug. Wash; transfer the clear filtrate and washings to a 600 ml. beaker and titrate for Cr content with  $\text{KMnO}_4$  and ferrous sulphate standards as in ordinary chromium steels.

Get the chromium value of these standards by weighing into the corresponding blanks 5 and 10 mg. of C.P.  $\text{K}_2\text{Cr}_2\text{O}_7$ . Add this dichromate to the filtrates from the water insolubles from the carbonate and nitre fusions of the blanks. That is, add the  $\text{K}_2\text{Cr}_2\text{O}_7$  after the filtrates have been acidulated with 1:3  $\text{H}_2\text{SO}_4$ . Then take to fumes and put through all subsequent operations and titrate for Cr. (See calculations.)

#### Calculations

$\text{Fe}_2\text{O}_3$ —Average of two tests ( $\frac{1}{2}$  portions) after passing through reductor gave 0.0024 gm. Fe. Hence  $0.0024 \times 2 \div 0.7 \times 100 \div 0.021$  (weight of total insoluble) = 32.90 (per cent  $\text{Fe}_2\text{O}_3$  in ash).  $0.0024 \times 2 \div 0.7 = 0.0069$  (gm.  $\text{Fe}_2\text{O}_3$ ) (1 cc. of  $\text{KMnO}_4$  standard = 0.00253 gm. Fe.)

$\text{Cr}_2\text{O}_3$ —Average of two analyses, by titration with ferrous am. sulp. standard, gave 0.0068 gm. Cr. Hence, as this was total Cr in ash,  $0.0068 \times 1.46 = 0.0099$  (gm.  $\text{Cr}_2\text{O}_3$ ).  $0.0099 \div 0.021 \times 100 = 47.14$  per cent  $\text{Cr}_2\text{O}_3$  in ash. (1 ml. ferrous standard = 0.00082 gm. Cr.)

$\text{Mn}_2\text{O}_3$ —An average of two one-half portions of the  $\text{K}_2\text{S}_2\text{O}_7$  fusion put through as described, required 3.8 ml. of the arsenite standard to titrate out the pink color. 1 cc. of this arsenite standard = 0.075 mg. Mn. Hence,  $3.8 \times 2 \times 0.075 = 0.54$  mg. Mn.  $0.54 \div 0.72 = 0.75$  or 0.75 mg. of  $\text{Mn}_2\text{O}_3$ .  $0.00075 \times 100 \div 0.021$  gm. = 3.60 per cent  $\text{Mn}_2\text{O}_3$  in the 0.021 gm. of ash.

$\text{Al}_2\text{O}_3$  and analyses of ash—The 21 mg. of total ash by direct determination of the constituents except  $\text{Al}_2\text{O}_3$  are divided as follows:

Weights of Insolubles	Per Cent Constituent in Ash
0.0099 gm. $\text{Cr}_2\text{O}_3$	= 47.1
0.0069 " $\text{Fe}_2\text{O}_3$	= 32.9
0.00075 " $\text{Mn}_2\text{O}_3$	= 3.6
0.0035 " $\text{Al}_2\text{O}_3$	= 16.7
(The $\text{Al}_2\text{O}_3$ by difference, or $0.021 - 0.0175 = 0.0035$ gm.)	

The above weights of insolubles are equivalent to:

	Per Cent in the Iron Itself
$0.0099 \times 100 \div 20$ (gm.)	= 0.049 $\text{Cr}_2\text{O}_3$
$0.0069 \times 100 \div 20$	= 0.035 $\text{Fe}_2\text{O}_3$
$0.00075 \times 100 \div 20$	= 0.0038 $\text{Mn}_2\text{O}_3$
$0.0035 \times 100 \div 20$	= 0.0175 $\text{Al}_2\text{O}_3$

The foregoing details apply to the complete analysis of the total silica free insolubles in all steels if same are sufficiently discolored to show appreciable amounts of oxides other than  $\text{Al}_2\text{O}_3$ .

$\text{TiO}_2$ —If the  $\text{Al}_2\text{O}_3$  is not appreciably discolored but it is desired to check for the presence of  $\text{TiO}_2$ , it is fused with  $\text{K}_2\text{S}_2\text{O}_7$  and fusion dissolved in 1:3  $\text{H}_2\text{SO}_4$  as already described, and the  $\text{TiO}_2$  determined by the  $\text{H}_2\text{O}_2$  color method which is of excellent accuracy.

Note: The analyses of the "Special" iron are from two different lots. In the first instance, a bar sample was analyzed, and the second sample was a sheet.

(Concluded on Page 64)





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(Concluded from Page 62)  
**28 PER CENT CHROMIUM IRONS**  
 (No Carbonate Extraction)

	Total Silica Free Ash from Insol- ubles, gm.	Silica Free Ash in Iron, Per Cent
No. 475 — 28% Cr, 0.27% C	0.0123	0.061
No. 469 — 28% Cr, 0.17% C	0.0099	0.0495
No. 456 — 28% Cr, 0.37% C	0.0066	0.033

The ashes in the three above heats were (dark brown) black in color like that of the "special" iron. In the same manner as given for the black ash in the "special" iron, the ashes from these 28 per cent chromium irons were found to contain by direct determination of the  $\text{Cr}_2\text{O}_3$ ,  $\text{Mn}_2\text{O}_4$ ,  $\text{Fe}_2\text{O}_3$ ; and the  $\text{Al}_2\text{O}_3$  by difference, the following:

	Milli- grams (12.3)	Per Cent in Ash	Per Cent in Alloy
(Total ash =			
No. 475 0.27 C			
$\text{Fe}_2\text{O}_3$	2.14	17.40	0.0107
$\text{Mn}_2\text{O}_4$	2.46	20.00	0.0123
$\text{Cr}_2\text{O}_3$	7.15	58.25	0.0357
	11.75		
Total ash =	12.30		

$\text{Al}_2\text{O}_3$ by difference	0.55	4.47	0.0027
Totals	12.30	100.12	0.0615

No. 469 0.17 C			
$\text{Fe}_2\text{O}_3$	1.76	17.77	0.0083
$\text{Mn}_2\text{O}_4$	1.60	16.16	0.0080
$\text{Cr}_2\text{O}_3$	6.28	63.43	0.0314
	9.64		
Total ash =	9.90		

$\text{Al}_2\text{O}_3$ by difference	0.26	2.63	0.0013
Totals	9.90	99.99	0.0495

(Total ash =	6.60)		
No. 456 0.37 C			
$\text{Fe}_2\text{O}_3$	0.85	12.88	0.0042
$\text{Mn}_2\text{O}_4$	0.96	14.54	0.0048
$\text{Cr}_2\text{O}_3$	3.06	46.33	0.0153
$\text{Al}_2\text{O}_3$ by difference	1.75	26.21	0.0086
Totals	6.60	99.96	0.0329

Heat No. 456 was run three different ways: with carbonate extraction, without, and with double the usual amount of nitric acid. The results differed only slightly:

With carbonate extraction, total insolubles, 0.0060 gm.

No carbonate extraction, total insolubles, 0.0065 gm.

Double nitric attack, total insolubles, 0.0066 gm.

These were duplicate determinations.

These 28 per cent chromium irons dissolve with violent rapidity in the 1:3  $\text{H}_2\text{SO}_4$ . It is interesting to note that the lowest carbon heat shows the highest  $\text{Cr}_2\text{O}_3$  content, i.e., more than twice as much. Also, that the 0.70 per cent carbon, 17.50 per cent chrome stainless showed 0.003 per cent  $\text{Cr}_2\text{O}_3$  in the iron as compared to 0.031 per cent  $\text{Cr}_2\text{O}_3$  in the No. 469.

	Per Cent $\text{Al}_2\text{O}_3$	Per Cent $\text{SiO}_2$	Per Cent $\text{Cr}_2\text{O}_3$
Stainless 0.70 C	0.005	0.003	0.003
17.50 Cr			
0.40 Si			
U. S. Bureau No. 106			
0.342 C			
1.29 Cr	0.013	0.003	
0.25 Si	0.015	0.003	
1.06 Al			

It occurred to the writer that, perhaps, the heating to boiling of the acid insoluble with the carbonate solution might dissolve some of

the  $\text{Al}_2\text{O}_3$  along with the silicon gel. To test this doubt, five of the steels shown in the table were run for  $\text{Al}_2\text{O}_3$  only, omitting the boiling hot carbonate extraction which is necessary to complete removal of silicon gel. The following tabulation shows no appreciable increase of  $\text{Al}_2\text{O}_3$  on omitting the carbonate, except in the case of U. S. No. 106 nitralloy steel, where the metallic Al is 1006 per cent:

	Acid Insolubles Extracted with $\text{Na}_2\text{CO}_3$ $\text{Al}_2\text{O}_3$ , Per Cent	$\text{Na}_2\text{CO}_3$ Extraction Omitted $\text{Al}_2\text{O}_3$ , Per Cent
No. 16b	0.009	0.012
No. 55A	0.003	0.003
No. 354	0.012	0.013
No. 358	0.012	0.012
No. 106 U. S. Bureau	0.013	0.025
	0.013	0.026
1.06% Al nitralloy	0.013	0.026
	0.014	0.026

Since performing all of the foregoing analyses, the U. S. Bureau of Standards has advised the writer that the Bureau has just completed the  $\text{Al}_2\text{O}_3$  and  $\text{SiO}_2$  of No. 16b and finds 0.009 and 0.010  $\text{Al}_2\text{O}_3$ ; and 0.0012 and 0.0016  $\text{SiO}_2$ .

Evidently when the steel contains a large amount of metallic Al of the order of 1 per cent, for example, there may be some  $\text{Al}_2\text{O}_3$  present that is soluble in the carbonate; in which case, the silica would have to be determined on a separate weight of the sample. The other four steels did not show appreciable

differences, either with or without carbonate extraction as made in the method as described. It may be that, where the metallic Al content is of the order of 1 per cent, the steel may contain  $\text{Al}_2\text{O}_3$ , as such, which is insoluble in the carbonate; and also  $\text{Al}_2\text{O}_3$  as a silicate which is soluble in the hot carbonate. J. S. Acken, U. S. Bureau of Standards, states that the carbonate treatment dissolves 95 per cent of any Al present as nitride.

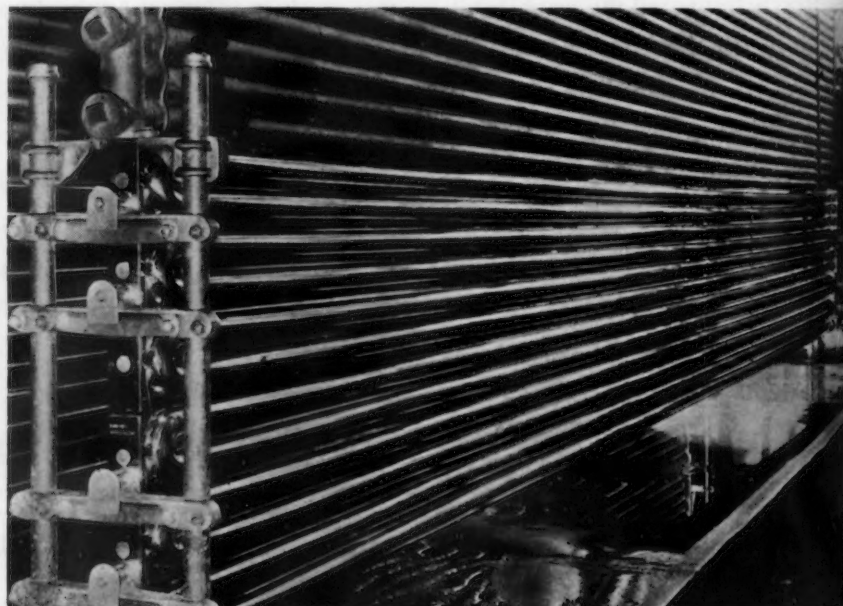
### Use of Perchloric Acid Chromium Oxide in High Carbon—High Chromium Corrosion-Resisting Steels

The following scheme is being investigated: After the mixture of carbides, oxides, silicides from the high carbon-high chromium steels have been treated with the nitric acid in the main solution, separate the insolubles by decantation. Pour the solution and insolubles into a 1000 ml. graduated cylinder, rinsing all insolubles carefully into the same, with a final volume of about 800 ml. Permit the insolubles to settle until the next day or longer until the supernatant liquid is perfectly clear. Then carefully siphon off all but about 50 ml. of the clear solution, taking great care not to disturb the sediment. This remaining liquor and sediment are rinsed into a 250 ml. beaker. The volume concentrated to 60 ml. by evaporation, below boiling. To this 60 ml. is added an equal amount of 60 to 70 per cent perchloric acid. This mixture is warmed to dissolve the carbides away from the oxides.

## Beer Cooler of Rustless Steel

**TWO-SURFACE** Baudalot-type ammonia beer cooler, fabricated of Enduro stainless steel by York Ice Machinery Corp., York, Pa., and Canton, Ohio, and installed in Kings Brewery, Inc., Brooklyn. This is the first rustless steel cooler of this type in brewery service. Each surface of the cooler is 12 pipes high and 24 ft. long. The pipes are 2½-in. O.D. drip lip electric welded Enduro tubing,

manufactured by Steel & Tubes, Inc., Cleveland. The cooler is of welded construction throughout, no solder having been used. All parts that come into contact with the beer, including combination supporting and deflecting lugs, are of Enduro. Each deflector strip is rolled into and forms a part of its respective tube. The cooler is adapted for the use of water or brine as the cooling medium.







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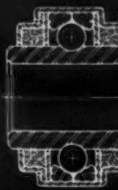
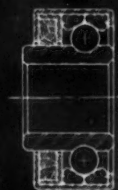
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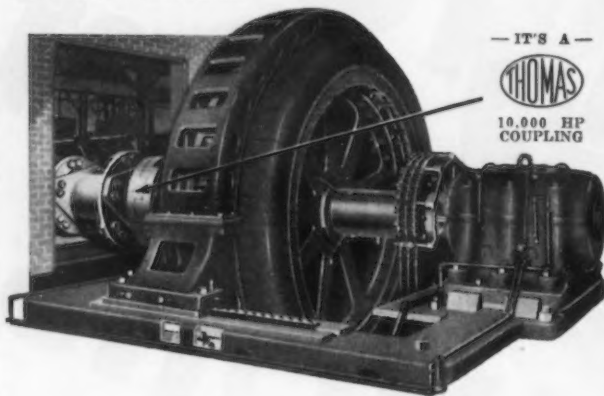
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New York State: Syracuse Supply Co., Syracuse, N. Y., also Rochester, N. Y.  
Pennsylvania: Arch Machinery Co., 1005 Park Bldg., Pittsburgh, Pa.  
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ALL KINDS OF CONTACTS ARE  
MADE THROUGH THE

## Classified Sections

The classified sections of The Iron Age are a frequent means of contact for all kinds of services. ¶ Somebody wants to locate a company to make certain parts or machines for him, and turns to the Contract Manufacturing Section. ¶ Somebody else is looking for a bargain in used equipment and turns to the Clearing House Section. ¶ Another is watching for Business Opportunities, and keeps his eye on that section. ¶ Then, of course, there is the active Employment Section where men and positions get together. ¶ See the pages following the Products Index.

# JUST BETWEEN US TWO

## Ardor-Firers at Work

AT least two thousand manufacturers long to have you look lovingly at their product. They make the things you buy—bolts and nuts, steel, lubricants, hoists, fire brick, stampings, and such.

To fire your ardor they have their salesmen call on you. The average cost of a salesman's call is between three and four dollars. That's big money. So the manufacturer lies awake nights figuring how to enable his salesmen to get more orders per hundred calls.

He reasons, "If I can arouse interest in my product and desire for it, my salesmen will be able to secure orders in fewer calls."

## Eyes Open

SO he says to his salesmen, "Keep your eyes open and find out what trade papers the men you call on read." (Halt for a while while tempus is fugiting.) Before very long, if the manufacturer is a wise man, you are learning about his product from the medium you depend upon to supply you with information about developments in your industry—your trade paper.

Sounds logical, doesn't it? Like following a straight line to get from one point to another in the shortest time. Most manufacturers follow this procedure. A few do not. Some say, "Selling is the salesmen's job. We make a good product. It is up to them to sell it." Of course, a good salesman can get results barehanded, but his job is made harder and the ultimate selling cost is higher.

## He Asked for Suggestions

ONLY the other day a salesman for a well-known company that is either selling or trying to sell you was telling us about what happened at a recent sales convention. The president said, "Has anyone any suggestions to offer whereby we can help you men increase your sales?" One salesman spoke up, "Most of the people I call on read The Iron Age. It would help me a lot if we got them acquainted with our company and our product by advertising in that paper."

"Now, now," said the president, "I don't want that kind of a suggestion. Selling is *your* job." Nobody made any more suggestions.

## The Anchorite Complex

THEN there's the manufacturer who believes in advertising but who doesn't use trade papers because if he did his advertising would be in with competitors'. He wants to be by himself. Maybe this is a good idea, but we doubt it. The merchant whose store is in the shopping center, smack up against competition, usually does the best business.

Those manufacturers who crave exclusiveness are obliged to use letters and circulars. For certain purposes, there's nothing like a letter or a circular, but they run into considerable money when burdened with the entire job of building up a demand for a given product. The cheapest kind of postage on a 10,000 mailing is \$100, and that is just one of the cost items. A whole page in The Iron Age costs only \$100, on a page a week basis, and we mail out more than 10,000 copies.

## Maybe Yes, Maybe No

"BUT it isn't entirely a matter of relative cost," we hear our direct mail over-user object. "Our individual letter or circular makes a greater impression than would a page message in a trade paper."

Mebbe so, mebbe not. It all depends. Some letters are never read, and don't deserve to be; some trade paper ads are skipped over, and deserve to be. But this is a fact: a trade paper that has been in existence for, say, ten years or more, and has as paid subscribers most of the people in its field, is a pretty safe bet as a reputation-builder for anyone making a good product. The fact that people have used it over a long period, and have paid for the privilege, shows they are in the habit of depending upon it. Where such a powerful influence is available, does it not seem unwise not to use it?—A.H.D.



# THE IRON AGE

DUCTION -- MANAGEMENT

SEPTEMBER 28, 1933

PROCESSES -- NEWS

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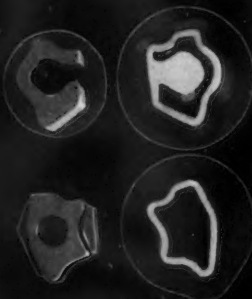
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out your die casting and machine tool problems. Whatever your problem or requirement in this field, we can be of valuable service to you. Write for our specialized literature or request one of our sales engineers to call. There is no obligation.

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